

# COMPUTERWORLD



## Hitting the road

Mobile computing means freedom for users and headaches for IS managers. Expert Andrew Seybold offers guidance to steer a clear path down the treacherous wireless and notebook configuration lanes. Also, our 200-user Buyers' Satisfaction Scorecard survey evaluates leading color notebooks from Apple, Compaq, IBM and Toshiba.

For all that and more, see CW Guide, page 89

## DEC to lay off 20,000, looks to sell off units

By Mary Brandel

Digital Equipment Corp. Chief Executive Officer Robert Palmer confirmed last week that he would cut 20,000 jobs or so and spin off or sell major parts of the business to return the company to sustained profitability.

In an interview with *Computerworld* last week, Palmer characterized cost-cutting and profits as his top priorities. He acknowledged that Digital's costs and revenue per employee are higher than those of competitors IBM and Hew-



Digital CEO Robert Palmer: 'Customers don't buy financials. They buy products.'

lett-Packard Co.

An "absolutely essential" component of the cost-cutting strategy, he said, is to move more products through indirect channels.

Last week, Palmer also outlined the following actions to employees:

- Using the revenue-per-employee metric as a guide, reduce head count to 65,000

people or fewer, a total loss of 20,000. "Failure to act promptly will result in greater loss of employment," Palmer told employees.

Digital, page 10

## IBM PC Co. retrenches

By Jaikumar Vijayan

Last week's sudden resignation of IBM PC Co. President Robert J. Corrigan, in concert with the massive management reorganization that followed, was widely viewed by analysts and users as IBM's attempt to rein in the autonomy of its desktop unit. Observers viewed the move with concern.

The revamp, which surprised

many industry observers, puts G. Richard Thoman, a senior vice president and IBM group executive, in charge of the PC Co. A quartet of newly appointed general managers with worldwide responsibilities will assist Thoman in running the business.

"The PC Co. under Corrigan has come a long way over the last year. It is disappointing to see it slip back into the hands of Armonk," said Randal Giusto, a se-

► IBM revamps sales force to focus on specific industries. See page 4.

### On track

Do you think turnaround efforts at the IBM PC Co. have been headed in the right direction?

|            |    |
|------------|----|
| Yes        | 96 |
| No         | 14 |
| DON'T KNOW | 10 |

BASE: 120 IBM PC USERS  
Source: Computerworld Database Division, Framingham, Mass.

nior industry analyst at BIS Strategic Decisions in Norwell, Mass.

The replacement of Corrigan with a four-member team that reports back to an IBM group executive adds an additional layer of bureaucracy and dilutes much of the unit's earlier autonomy, analysts said.

Users agreed. "Recentralization carries with it the danger of going back to the committee method of addressing the PC market," said David Pinkard, a technical an-

IBM, page 14

### TCP/IP and IPX

## Protocol choices simplified

By Elisabeth Horwitt

The last holdouts in the client/server industry are expected by year's end to ship support for Novell, Inc.'s IPX and the de facto net-

working standard TCP/IP, potentially making life much easier for corporate network administrators.

The holdouts include Microsoft Corp., Apple Computer, Inc. and Banyan Systems, Inc.

The catch is that IPX and TCP/IP, both widely installed network protocols, have problems and limitations that make them less than perfect transports. This is particularly true for extensive enterprisewide networks, user and analyst sources said last week.

### Less is better

The ability to limit network traffic to just one or two protocols will take a great load off the shoulders

Protocols, page 16

## DMV disaster

California kills failed \$44M project

By Jean S. Bozman

SACRAMENTO, CALIF.

California's Department of Motor Vehicles spent \$44 million over seven years to overhaul its aging computer system. But when the state finally pulled the funding plug last week, not even one new application had been written.

In an effort to find out what went wrong, the state legislature just approved a \$500,000 expenditure for an independent consultant to review the DMV project.

"It was a big project that was on technology's cutting edge in 1987, when the buzzword was relational databases," said DMV spokesman Evan Nossloff. "We tried to throw the long bomb from the backfield up to the front, and that kind of strategy is fraught with peril."

After legislative budget hearings revealed a quiet Jan. 1 cancellation of the project, finger-

DMV, page 16



Two on-line databases at the California Department of Motor Vehicles hold 220G bytes of data on 25.7 million vehicle registrations and 24 million driver's licenses and IDs.

## Intel seeks to shelve 486

By Michael Fitzgerald

Intel Corp. wants to see users move from the i486 to the Pentium chip and recently launched its most aggressive strategy yet to make that happen.

Intel will push the 60-MHz Pentium in place of its fastest 486, the 33/100-MHz DX4, as the high-volume desktop processor for 1994, according to sources at PC hardware makers. This means Pentium systems should be broadly available at the \$2,000 level in the third quarter.

### Releasing the brake

"Intel has a lot of Pentium 60s and wants to make sure they get sold," said Dean McCarron, an analyst at Mercury Research in Scottsdale, Ariz. "And they also wanted the market to go to

### Chipping away at the 486

Intel seems to be squeezing the DX4, which is priced at \$580, by dropping Pentium pricing

| PROCESSOR                | CURRENT PRICE | Q3 PRICE |
|--------------------------|---------------|----------|
| 60/90-MHz Pentium (P54C) | \$830         | \$615    |
| 60-MHz Pentium           | \$660         | \$375    |
| 33/66-MHz 486 DX2        | \$355         | \$256*   |

\*This price is available now, according to hardware vendors  
Source: Mercury Research, Scottsdale, Ariz.

Pentium a little faster, and DX4 was putting the brakes on that."

Intel had previously anointed the 100-MHz DX4 as its likely mainstream processor for 1994, and the strategy shift has infuriated some

Intel, page 15

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**You Can Play Around  
With Windows NT On Another  
Microprocessor.**






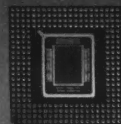


P u t t i n g I m a g i n a t i o n T o

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## Now Imagine A Microprocessor With The Horsepower To Harness Windows NT. Alpha AXP Does It Now.



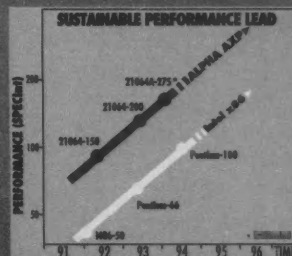
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applications shipping now and hundreds more on the  
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a long-term

architecture based  
on a scalable  
RISC design and  
standards like the



PCI local bus. And it's available to any PC maker—  
from us now, and later this year from our second source  
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PATRICIA BARRY LEVY

## IN DEPTH

### E-MAIL TRAVAILS

**Steve Dickson, US West's E-mail chief, says administering LAN-based mail can be a headache. Mix in dicey reliability and security and you could have a technology Molotov cocktail in the making.**

Page **101**

## NEWS

■ In theory, users say, **Microsoft and Texas Instruments'** plans to jointly develop a repository sound great. But customers wonder whether the vendors can really pull it off. *Page 2*

■ In its biggest sales reorganization in decades, **IBM** will reorient along industry lines rather than its traditional geographical breakdowns. *Page 4*

■ **AT&T and Novell** will construct a public network service based on Novell's popular NetWare. It promises to extend NetWare into the wide area and could quickly promote electronic commerce, industry analysts agreed. *Page 8*

■ Seeking to address the needs of corporate developers who are hitting a wall trying to create complex client/server applications with existing tools, **Symantec** will announce Enterprise Developer next week. *Page 12*

■ **Sybase** one-ups database rivals by unveiling a line of middleware gateways for making client/server easier to swallow, users say. *Page 14*

■ The **Clinton administration** is neglecting the security needs of the mainstream business community, observers agree. *Page 30*

## DESKTOP COMPUTING

■ **32-bit OS/2 applications** are finally making their way to users, but it may be too late for OS/2 to make a big splash as anything but a server system. *Page 43*

## WORKGROUP COMPUTING

■ **Dell** shows off a new high-end server as its new strategy begins to take shape. *Page 51*

## ENTERPRISE NETWORKING

■ **Visa International** shunned the big boys and went with a relative unknown for some of its wireless needs. *Page 60*

## LARGE SYSTEMS

■ Managing data warehouses in the client/server world still lacks some essential tools. *Page 67*

## APPLICATION DEVELOPMENT

■ Early adopters of **Microsoft's** Control Devel-

oper's Kit have mostly good things to say. *Page 75*

## MANAGEMENT

■ Like the airline and health care industries, **electric utilities** are undergoing a competitive revolution with huge implications for their IS organizations. *Page 81*

## CAREERS

■ Multimedia use on the network is expected to significantly impact **network management careers** during the next three years. *Page 110*

## MARKETPLACE

■ Buyers beware: Prices for similar **data processing configurations** at hot sites can vary by as much as 1,000%. *Page 120*

## COMMENTARY

■ **Paul Gillin** suggests that the federal government's "meddling" with flat-panel display vendors may just work. *Page 38*

■ **Charles Babcock** says IS executives are expected to be superheroes these days as budgets shrink. They are looked on to lead the charge into client/server and new technologies. *Page 6*

■ Artificial intelligence is not an oxymoron, **Michael Schrage** says. In fact, it is being used — quietly and effectively — in some of the world's largest corporations. *Page 39*

■ Communication is more important than ever as a tool for IS managers, **Akram Yosri** says, especially in this age of outsourcing. *Page 39*

■ **Michael Fitzgerald** believes Intel and Microsoft's heyday may be coming to a close. *Page 44*

■ **Gary Anthes** outlines how collaboration by computer really works — or should. *Page 59*

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## Executive Briefing

**Entergy**, the nation's fifth-largest energy provider, is building a plug-and-play network that owes allegiance to no vendor. To prove it, Entergy is pulling out most of its **Novell** servers. Meanwhile, energy firms in general are retooling to become more competitive. *Pages 67 and 81*

**California's Department of Motor Vehicles** pulls the plug on a \$44 million information systems project as it tries to figure out what went wrong. *Cover 1*

**Uproar in the vendor community continues**, as **IBM PC Co.** President Robert Corrigan resigns unexpectedly. **Microsoft** and **Sybase** argue over who gets the kids in the aftermath of their divorce and once-promising upstart **Solbourne** lays off 65% of its work force. *Pages Cover 1, 4 and 34*

**Amtrak and Esprit de Corp.** go the outsourcing route to save money. *Pages 30 and 68*

As **Microsoft** acknowledges it will be six months late delivering its Cairo operating system, **Micro Focus** unveils a tool that enables Cobol programmers to get to objects in a familiar environment. Also, **Object Design** and **Digital** team up. *Pages 4, 24 and 34*

**Companies share their secrets** about how to get yours. *Page 52*

**IBM** announces user-based pricing for **AS/400** software, but larger companies may be asked to pay the freight for their smaller brethren. *Page 6*

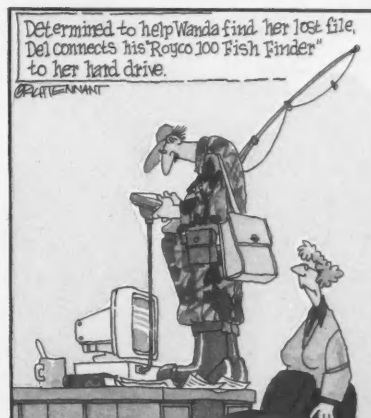
As industry support rallies for **Novell** and **TCP/IP** protocols, **Ungermann-Bass** sets a new pricing standard for ATM products. *Cover 1 and page 12*

Although most companies are slow to adopt electronic forms, **Frito-Lay** is using **Lotus' Notes** for business-to-business communications — against experts' advice. *Pages 2 and 59*. At the same time, workflow and document management standards are coming along. *Page 12*

The argument over flat-file vs. relational databases on the desktop seems to be settled, with price the determining factor. *Page 43*

**South Africa's elections** were helped along with interactive, touch-screen multimedia kiosks that helped explain issues and candidates to more than a million voters. *Page 75*

## The 5th Wave by Rich Tennant





# Skeptics mull Microsoft/TI pact

By Stuart J. Johnston, Ed Scannell  
and Melinda Carol-Ballou  
REDMOND, WASH.

■ While users were generally optimistic about last week's announcement of a joint repository specification by Microsoft Corp. and Texas Instruments, Inc., potential customers and analysts were cool in their long-term assessment of the deal.

One reason is the desire for more assurance that the two companies will not repeat the sins of their predecessor, IBM, which failed to make its AD/Cycle initiative succeed because its fundamental approach was too proprietary.

"If TI and Microsoft can truly keep this open so you can use whatever tools you want, then they have a much greater chance at pulling this off," said Mike Brown, manager of data resource management at PSI Energy, Inc., an electric utility in Plainfield, Ind.

Even with the promise by both companies of a more open approach, IBM's failure still leaves many users and analysts

with lingering doubts about the concept.

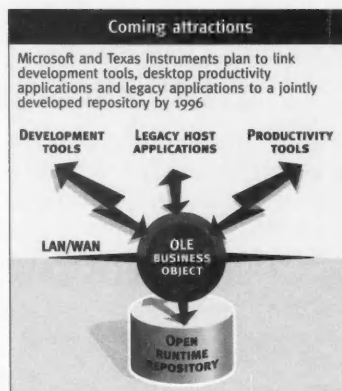
"The lack of success of AD/Cycle indicates that it will be difficult to have an encyclopedia in the sky, even if it does reside on the LAN," said Ed Acly, an analyst at Technology Investment Strategies Corp. in Framingham, Mass. Developers and third parties "are unruly and don't want to standardize on competitive encyclopedias," he added.

Acly also noted that both vendors have much to prove in this new arena. "TI has little credibility on the desktop, and to a significant degree, Microsoft has little credibility on the enterprise," he said.

## Draft spec on way

The TI/Microsoft agreement will result in an application programming interface specification due out in draft form this fall. The first Microsoft Windows NT-based repositories that conform to it are expected in about two years [CW, May 2].

Some third-party sources close to Microsoft, however, said that performance problems of Object Linking and Embedding (OLE) may plague the repository until it becomes available on Cairo.



"OLE 2.0 [can] take up to 20 seconds to activate an embedded object for editing because it has to be stored inside the file of the OLE container object," the source said. "Cairo will map that embedded object as a separate object on the file system, which will be much faster."

Microsoft officials denied that these

problems exist, but several corporate developers said they are looking forward to the release of Cairo to alleviate them [CW, March 21].

TI will ship a version in August of its client/server Information Engineering Facility (IEF) for Windows NT Advanced Server, said Keith Short, director of advanced development at TI's Advanced Information Management Division.

Brown said PSI Energy uses IEF for its enterprisewide development efforts. "For smaller departmental applications, we use Visual Basic," he noted. "Being able to use any of those types of tools from a single repository [for] development and sharing objects is exactly where we want to go."

Still, many users remain skeptical and have a "show-me" attitude.

"Until you get to the point of producing a product, it is just something we watch without doing any active planning," said Ronan McGrath, vice president of information systems and accounting at Canadian National Railway Co. in Montreal.

## Interest in electronic forms picks up

By Lynda Radosevich

Lotus Development Corp.'s entrance into the fledgling electronic forms market last week will help spur information managers to adopt the technology, according to users and analysts.

The kick is needed because paper forms make up a shocking percent of business costs, and the cost savings and quality improvements of implementing electronic forms are largely undisputed.

"There's considerable waste out there. I've seen companies spending \$6 billion per year on paper forms and throwing out \$2 billion per year," said Bob Flanagan, director of WorkGroup Technologies, Inc. in Hampton, N.H. "With electronic forms, you can update the form and replicate it throughout the company so it is never obsolete."

older platforms.

"We're always a little slow, aren't we?" said Jim Arcure, a systems integration specialist at Colgate-Palmolive Co. in New York.

"A lot of people feel comfortable with paper. It takes time; it's not going to happen overnight," said Ameet Patel, a senior project manager of emerging technologies at

distant fourth with its E-forms tool kit for Visual Basic, is working on an overhaul, analysts said.

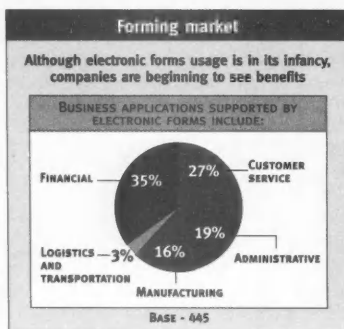
## Making connections

In addition to using the messaging structure to route electronic forms, the LAN packages connect to databases on the back end to populate form fields with information. The benefits of using electronic forms include the following:

- Savings from eliminating printing paper forms and throwing out obsolete ones.
- Increased data-entry accuracy due to automation.
- Savings of employee time.
- Better tracking and routing capabilities.

"Forms are becoming a major front end to E-mail systems and databases," said Michael Bragen, a senior analyst at Business Management Consulting in Lexington, Mass. "They are extremely useful and popular with nontechnical people because they provide a familiar framework for information."

For example, Colgate plans to use Lotus Forms as a front end to a mainframe DB2 database by developing forms with check boxes and fields that let end users extract data. That will replace a much more cumbersome method that employees in 56 countries use to upload and download corporate financial information, Arcure said.



Source: BMC Research, Lexington, Mass.

## Holding up adoption

Yet analysts say only about 2% of LAN-connected PCs have forms-processing capabilities.

For instance, some companies say they want to wait until big-name vendors enter the market to ensure security and integration with their users' desktop applications. Others say they are getting their LAN and electronic-mail infrastructures in place and do not want to launch the applications on

BASF Corp. in Parsippany, N.J.

Lotus' entrance should help nudge the market because it will appeal to the large installed base of CC:Mail and Notes users, analysts said (see story at right).

Also catalyzing growth, the Top 3 vendors in the LAN electronic forms market — JetForm Corp., Delrina Corp. and WordPerfect Corp. — have updated their products in the past six months. And Microsoft Corp., which places a

## Lotus unwraps Forms offering

Last week at Network/Interop '94, Lotus announced software for creating, using and routing electronic forms.

Lotus Forms, which will ship next month, has a Windows-based design program and runtime programs for filling in forms. It lets users replace paper-based processes by routing and tracking electronic forms over Lotus' CC:Mail and Microsoft's Mail.

It is differentiated from competing packages by its close integration with Lotus' Notes via Notes FX (field exchange) support, users and analysts said.

Other key features include the following:

- Intelligent clients that can route themselves across different mail systems.
- Access to data in Borland International, Inc.'s dBase and Paradox or other SQL databases.
- LotusScript, a programming language for developing more sophisticated forms and data feeds.
- Support for digital signatures.

Lotus Forms costs \$395 for the design program and five fillers, and \$149 for each filler after that.

—Lynda Radosevich

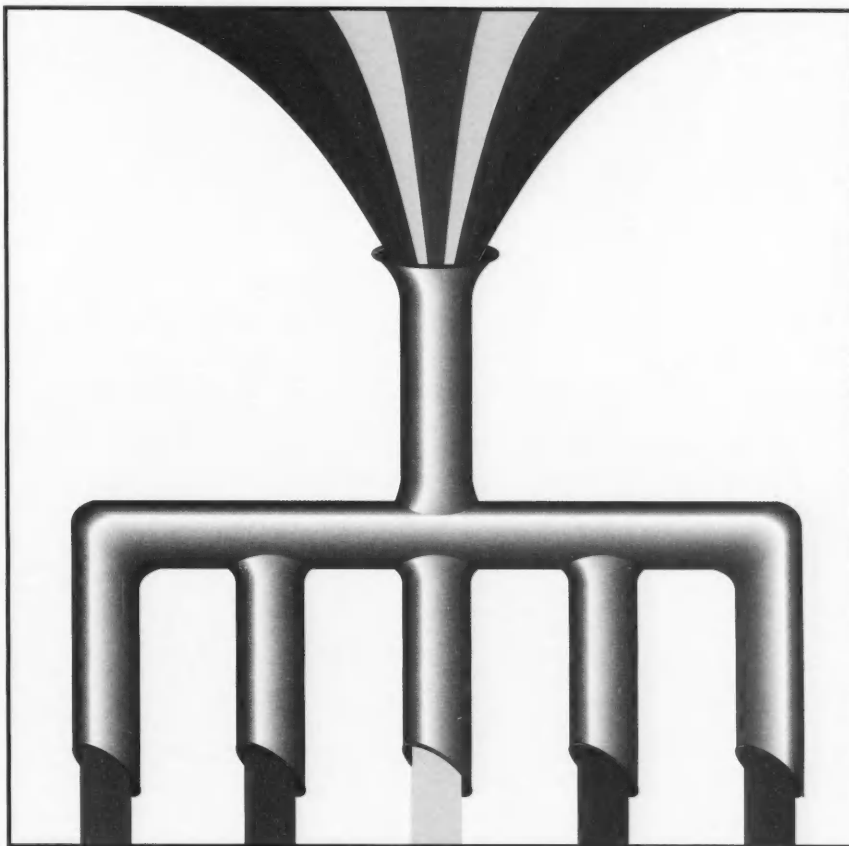
## Corrections

An article in the April 18 issue, "Great GUI," incorrectly stated that Neuron Data, Inc. charges a runtime fee for its Open Interface tool. Its price ranges from \$4,550 to \$9,550.

The telephone number for Advanced Visual Data, Inc. was incorrectly identified in a May 2 product announcement. The correct number is (617) 736-0860.

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# Cairo schedule slides to end of 1995

By Stuart J. Johnston and Ed Scannell  
REDMOND, WASH.

The road to Cairo just got a little longer.

A top Microsoft Corp. official revealed last week that Cairo, a crucial and major update of Windows NT originally slated to ship in the first half of 1995, has now slipped to the second half of the year.

"The truth is we moved a lot of people [off Cairo to work on] Daytona... and OLE in general, [so] we will not make the first half of 1995," said Jim Allchin, vice president of Microsoft's new Business Systems division.

## Road to Daytona

Daytona, a faster, smaller interim version of NT that is due out by mid-1994, is currently in beta testing at 10,000 to 12,000 sites, Allchin said (see story at right).

OLE, Microsoft's Object Linking and Embedding technology, is key to the company's future object strategy and will use Cairo's Object File System to track, store and retrieve objects.

Users were generally neutral about the delay because most have not yet made any hard-and-fast development plans for the product.

"Cairo is a strategic product, and we do not think of strategic products in terms of tactical deadlines," said Art Tisi, chief systems officer at the Metropolitan Museum in New York.

"Object-oriented operating systems are going to play a pretty major role in our businesses' future, but that is still three to six years away," said Bob Quick, assistant vice president and director of information technologies at Northern Life Insurance Co. in Seattle.

## Suspicious minds

However, some users suggested that Microsoft may have ulterior motives for letting Cairo's delivery schedule slip. They suspect that if Cairo is delivered as originally planned, it might confuse potential buyers of Daytona or Chicago, the next major version of desktop Windows.

Maybe Microsoft is a lot further along than it wants to acknowledge but it is a timing issue for the company, according to Tisi. "There is only so much stuff you can jam into a paper bag," he said. "I think they are trying to avoid a glut of products to market."

Even so, Cairo's slip could cause other problems. It could leave the door open for Taligent, Inc.'s and IBM's Workplace operating system technologies to

## Object vs. object

Component Integration Laboratories and other OpenDoc supporters claim the technology is superior to Microsoft's OLE because OpenDoc was initially designed to work in a distributed manner over networks, but some aspects are directly comparable:

| System                                   | Taligent                         | Cairo             | NextStep (Version 3.2) |
|--|----------------------------------|-------------------|------------------------|
| Availability                             | First half 1995                  | Second half 1995* | Now                    |
| Object-oriented user interface           | Yes (People, Places & Things UI) | Yes (Chicago UI)  | Yes                    |
| Microkernel-based                        | Yes                              | Yes               | Yes                    |
| Supports applications as objects         | Yes                              | Yes               | Yes                    |
| Supports distributed objects on networks | Yes                              | Yes               | Yes                    |

\*Previously first half

gain a foothold against it and OLE.

Noting the newness of the 32-bit, fully object-oriented operating systems market, an information systems executive at a large bank who is taking a hard look at Taligent's beta code, said, "Microsoft shouldn't be so cocky in telling us about Taligent's 'poor' chances."

## The Taligent factor

Taligent, a joint venture of IBM and Apple Computer, Inc., is expected to deliver its first software development kit for its first series of applications frameworks next month at its first developer's conference. The complete, shrink-wrapped version of the operating system is still expected to ship in the first half of 1995.

IBM, meanwhile, is expected to deliver OS/2 for the PowerPC in the first quarter of 1995. It will incorporate much of Taligent's object-oriented interface and underlying technologies and will also implement Component Integration Laboratories' OpenDoc technology for communication among distributed objects.

## Microsoft lays out update schedules

When Microsoft ships Daytona this summer, it will also ship a pair of 32-bit productivity applications and several server products.

Daytona was designed to be smaller, run faster and provide improved interoperability with key network technologies, such as Novell, Inc.'s NetWare and TCP/IP networks.

Updates for the NT workstation and NT Advanced Server, which are tentatively labeled Version 3.5, are slated to ship by midyear, but that may slip if beta sites report serious problems, said Jim Allchin, vice president of Microsoft's new Business Systems division, in an interview last week.

Products Allchin said are set to ship concurrently with or soon after Daytona include the following:

- 32-bit versions of Excel and Word.
- Enterprise Messaging Server (EMS), which will provide back-end storage and retrieval.
- Systems Management Server (SMS), code-named Hermes, which will provide an administration facility for software distribution and installation, hardware

and software inventory management and links to other systems management tools.

• An update to the SNA Server.

An update to SQL Server will add replication services, a key component if it is to compete with Lotus Development Corp.'s Notes. The update will ship later this year, Allchin said.

Several of the products, including Excel and Word, will not run on earlier versions of NT because they require OLE 2.01, which is included in Daytona.

He added that Microsoft's implementation of a promised software licensing server will likely be incorporated into a later version of SMS, not in this summer's release. The first version of SMS will, however, include Bloodhound, remote diagnostics technology that will let administrators do basic network analysis.

In a demonstration at Network/Interop '94 in Las Vegas last week, Allchin demonstrated EMS "auto-healing" itself using technology that lets the server restart in the case of a function failure.

—Stuart J. Johnston

# IBM sales force to play by new rules

By Thomas Hoffman,  
Rosemary Cafasso and Craig Stedman

In the most sweeping changes made to its sales structure in decades, IBM late last week announced plans to shift its sales force from a geographic orientation to one that is more industry-focused. Customers said they welcomed the long-anticipated move [CW, April 25].

"I would think that for the Fortune 1,000, this would be a very significant improvement," said William Anderson, chief information officer at Prudential Securities, Inc. in New York.

Other users were also upbeat about the potential flattening of IBM's elaborate, multitiered sales organization. "This may give you a shorter path within

IBM," said Doug Underhill, a technical specialist at CSX Technology, the information systems arm of CSX Corp. in Jacksonville, Fla.

## New blood needed

Tom Trainer, vice president and CIO at Reebok International Ltd. in Stoughton, Mass., was enthusiastic about the changes but took a cautiously optimistic approach to what will likely be a lengthy implementation. "It will probably take a couple of years for IBM to add the industry expertise," he said. "They're going to have to infuse some new blood from those industries with those credentials."

As part of its sales revamp, IBM will set up 14 industry areas — including banking, retail and insurance — where IBM

account executives can bypass the top branch managers through whom they were once forced to report.

IBM's shift to an industry-related focus will have to satisfy large users such as the University of Miami, where Lewis Tennesse, vice president of information resources, said sales support from IBM has diminished during the past year as the firm reduced employee head count. "I don't see what difference an industry-focused sales structure is going to make if I'm not receiving my PCs on time, or if I'm not getting the support I should have been getting in the first place," he said.

The latest IBM reorganization follows a slew of changes made to its sales force in recent years. However, many users and industry gurus are lending greater

importance to the current changes because they are being spearheaded by IBM Chairman Louis V. Gerstner.

Recently "account executives have been granted more empowerment with large accounts, which enables them to represent the client to IBM in a more forceful manner," Anderson said.

IBM already employs an industry focus in its New York and Chicago sales areas, and its Integrated Systems Solutions Corp. outsourcing unit markets through 16 separate industry groups, according to Robert Djurdjevic, president of Annex Research, Inc. in Phoenix.

Users in these regions said they have noticed the new approach from IBM's salespeople. "We are starting to see people who are more industry-focused," said Eugene Friedman, vice president of applied technology at The Chase Manhattan Bank NA in Brooklyn, N.Y.

# For Manufacturers Who Want To Get Close To The Customer, Here's How To Tango.

We call it "customer focused" manufacturing. But it's more than that. It's the first enterprise-wide manufacturing, financial and distribution software that incorporates your customers into every aspect of your operations.

So you're more responsive, more flexible and more productive.

Just ask Jack Boyles, Director of MIS at Van Camp Seafood Co., Inc. "Our customers demand incredible delivery schedules — virtually made-to-order. But we can handle it. CA-PRMS has raised the quality of operations to a whole new level."

Boyles says CA-PRMS is "the nerve center of our business. And the new release offers even greater integration. Distribution, finance and manufacturing all work together seamlessly."



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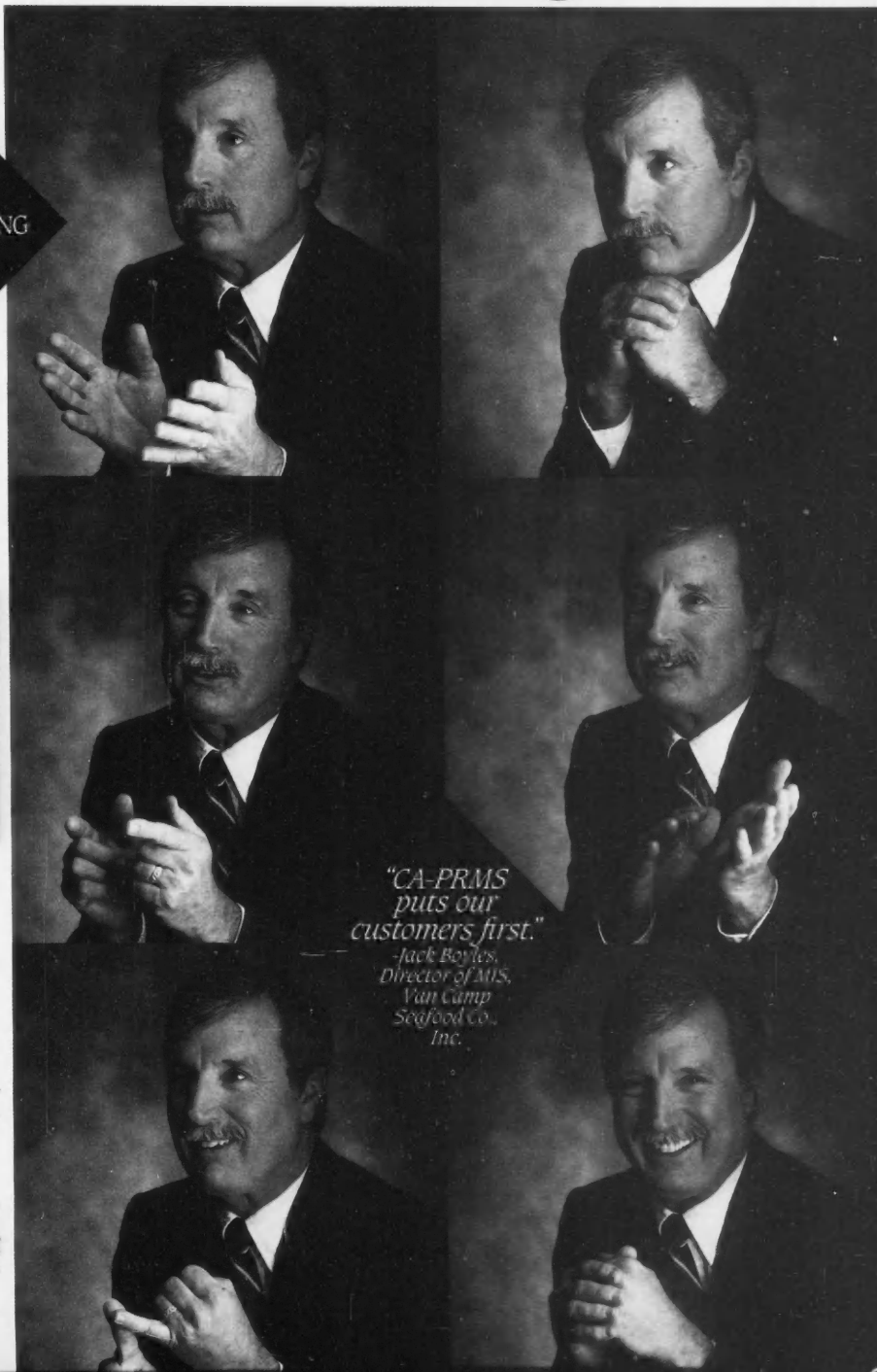
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*-Jack Boyles,  
Director of MIS,  
Van Camp  
Seafood Co.,  
Inc.*



## Survival in risky business

**D**eloitte & Touche found it's a lean and unforgiving atmosphere out there when the Big Six accounting firm surveyed 400 chief information officers recently. The survey indicated that budgets increased only 0.4% in 1993 while the Consumer Price Index rose 2.7%, which translates into a decline in real IS budgets.

At the same time, CIOs were expected to lead the charge toward re-engineering their businesses and moving critical applications onto client/server architectures. If it feels like you are getting more done with less, that may be because you are.

The hard figures are supported by anecdotal evidence I have picked up from IS managers in the San Francisco Bay area, Chicago and central Florida. IS managers must implement new applications in some form of client/server mode, and they can't even think about buying another mainframe. In many cases, they look forward to the day when they will move their applications to Unix servers and no longer pay mainframe software license and maintenance costs.

Client/server remains a shape-shifting term, with meanings that vary according to the setting, but everyone understands that it means making better use of PCs and delivering information

through a graphical user interface. One IS manager at a San Francisco bank said he was laboring under a purchasing freeze from his chief financial officer, who insists that existing PCs be fully employed before any more are bought. So client/server sometimes is an old idea masquerading as a new one: Make better use of what you've got.

According to the Deloitte & Touche survey, the CIOs believe 60% of their mission-critical applications need to be radically improved or redone. Getting more of them to client/server mode is part of the answer. Client/server applications have increased from 5% of the total in 1992 to 27% in 1993. The CIOs expect that percentage to increase to 57% by 1995.

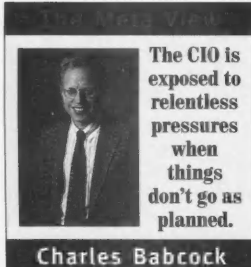
Behind these simple figures are many tales of stressful transitions and unexpected expenses. A hospital IS manager talking freely about his client/server project suddenly became guarded on the subject of expense. The project was over budget, but the presumed benefits were so great that no one was thinking of rolling it back. Nevertheless, he didn't want to spur a reexamination of it. (Health care, by the way, leads all industries in moving applications to client/server, the survey says.)

Asked to list the obstacles to implementing client/server, 43% of the CIOs named high implementation costs and lack of industry standards as major barriers; the No. 1 issue, cited by 54%, was lack of qualified personnel.

The combination of tight budgets, pressure to move to client/server and lack of qualified personnel all add up to one thing—a high degree of risk for the CIO. During the past three years, one-third of their predecessors were demoted or dismissed, the CIOs reported. In the same time frame, the number leaving voluntarily for other positions has climbed from 14% in 1991 to 19% in 1993, the survey showed.

Implicit in these figures, it seems to me, is the fact that many businesses are trying to remake themselves during a period in which technology is in flux; the CIO is exposed to relentless pressures when things do not go as planned.

It is not a reasonable era, and while some rear-guard types may be overdue to move on, the turnover rate during the client/server transition is artificially high. Effective IS leadership is difficult, if not impossible, under these circumstances. Concentrating on short-term results and survival is not the same thing as long-range leadership. Survival skills appear to be foremost among the many talents needed by IS managers.



Charles Babcock

Babcock is *Computerworld's* technical editor. His MCI Mail address is 575-2737.

## AS/400 gets per-user prices

Some customers' costs will decline, but others' will rise

By Craig Stedman and Thomas Hoffman  
NEW YORK

IBM plans to shift the AS/400's operating system to user-based pricing when OS/400 Version 3 ships later this year. But while the move will reduce software costs for some customers, it will mean increases for those with more users on their systems, IBM officials acknowledged.

IBM detailed its pricing plans last week while introducing OS/400 Version 3 and a series of RISC-ready AS/400 systems.

The number of OS/400 pricing tiers will also shrink from 19 to four, freeing customers to do some hardware upgrades without paying higher software fees, IBM officials noted.

"Some people will pay a little bit more [for OS/400] based on the number of users that they have, but the overall cost should be lower," said Dave Chorbha, an AS/400 product administrator.

Customer reaction to the user-based pricing plans was mixed. Some users applauded IBM's move and said they want to see similar initiatives from AS/400 application vendors. Others expressed concern at the prospect of paying higher prices for the operating system.

### Appealing prices

User-based pricing "on an intuitive level has a lot more appeal" than the existing OS/400 price structure, which is based on processor capacity, said Rich Kolbe, director of MIS at Harley-Davidson, Inc. in Milwaukee. "Now, if you upgrade to a new processor, it creates a revenue tidal wave" because software charges rise with capacity, he added. "That's a jarring hit."

Krish Kumar, MIS manager at Medex, Inc., a Hilliard, Ohio, manufacturer of medical care products, said he also expects to save on OS/400 costs. "I'm absolutely upbeat about these announcements," he said, adding that he now plans to ask Computer Associates International, Inc. for user-based pricing on its CAPRMS manufacturing software for the AS/400.

However, Marc Cohn, senior vice president of information systems at Enterprise Rent A Car Co. in St. Louis, was less pleased with IBM's plan. The agency may benefit in some cases, such as with a data warehouse system that essentially has a single user doing queries against it, Cohn said. But he expressed concern that large users "are being asked to subsidize the market" in order to make low-end AS/400s more competitive with Unix and PC servers.

Information Management Co. is evaluating per-user pricing for its version of the Tuxedo transaction monitor, which is being ported to the AS/400. Bob Gardner, vice president of marketing at the Edison, N.J., software vendor, agreed. "You have a wide disparity between the big guy and the little guy, and the little guy gets a break," he said.

Chorbha said the caps on OS/400 charges, ranging from 25 users on low-end AS/400s to 450 at the top of the line, should ease the burden

### Which side are you on?

IBM's new user-based pricing for OS/400 Version 3, compared with the old capacity-based pricing formula, could mean higher or lower costs, depending on the number of users

### Model F35

| Users | Cost     |
|-------|----------|
| 30    | \$15,600 |
| 50    | \$23,600 |
| 75    | \$33,600 |

(\$4,000 base fee for one user, plus \$400 for additional users; charges capped at 75 users.)

CAPACITY-BASED PRICE: \$19,400

### Model F95

| Users | Cost      |
|-------|-----------|
| 300   | \$144,600 |
| 450   | \$204,600 |

(\$25,000 base fee for one user, plus \$400 for additional users; charges capped at 450 users.)

CAPACITY-BASED PRICE: \$199,500

on customers with heavily populated systems. Industry analysts agreed, saying that the changes are not likely to be onerous for most customers.

"My net so far is that there's going to be more people that come out ahead than behind in this deal," said David Andrews, managing partner at D. H. Andrews Group, Inc., a Cheshire, Conn., consulting firm.

OS/400 Version 3 Release 1 is planned for general availability by mid-November, IBM said, although an interim release will ship next month with the new AS/400 models.

## Users want more

IBM's new AS/400 Advanced Series computers promise price/performance improvements of up to 65%, and their compact cabinets will accommodate PowerPC models due out in 1995. But some users and analysts view the machines as no more than a half-step on the road to PowerPC.

The Advanced Series systems, as well as OS/400 Version 3 and the revamped DB2/400 database, are "not stuff we're going to stand up and applaud," said Marc Cohn, senior vice president of IS at Enterprise Rent A Car Co. in St. Louis. "We kind of stayed in our

chairs and clapped politely."

Teresa Elms, president of the Elms Information Services Group, a consultancy in San Diego, called the Advanced Series hardware "a nonevent."

"Everybody is waiting for the RISC versions and trying to decide whether the AS/400 will live or die based on that [PowerPC] implementation," she said.

The increasing openness of the AS/400 is "an important step," and Enterprise Rent A Car expects to buy three of the new models in the next few months, Cohn said. "But the big improvement is a year away," he noted, when PowerPC-based machines and AS/400 clustering should both be ready.

—Craig Stedman



# Gentlemen, start your snails.

PC Magazine independently defined and ran a battery of real-world performance tests to compare database server software. PC Magazine states, "Oracle7 was the hands down winner on our performance tests, outperforming the others by a wide margin."

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IBM DB/2

17 hrs.

INFORMIX

36 hrs.

### LOAD AND INDEX

"Oracle7 finished the entire test suite in less time than most took just to load and index our data."

PC Magazine

## ORACLE7 ■ 47 minutes

IBM DB/2

154 min.

INFORMIX

154 min.

SYBASE

159 min.

### AD HOC QUERY

"Oracle7 completed the queries in a blistering 47 minutes, three times as fast as...the other products."

PC Magazine

## ORACLE7 ■ 47 seconds

IBM DB/2

636 sec.

SYBASE

657 sec.

INFORMIX

759 sec.

### CONCURRENT RANDOM WRITE

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PC Magazine

## ORACLE7 ■ 44 seconds

SYBASE

660 sec.

IBM DB/2

698 sec.

INFORMIX

759 sec.

### CONCURRENT RANDOM READ

"Oracle7's read-consistent model and record level locking helped it breeze through the test."

PC Magazine

Just to be fair, here's what PC Magazine had to say about the other guys:

Informix OnLine "Only after days and days of repeated crashes were we able to obtain a full set of results."

Ingres Server "...we would not recommend it because of the showstopping multi-user bug we encountered."

Gupta SQLBase "...took an unthinkable 60 hours to load the tables and then crashed on the index builds..."

For your copy of the complete PC Magazine article, including test results call 1-800-633-1071 Ext.8129.

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## News Shorts

**Lotus launches discount plan**

Lotus Development Corp. plans to launch this week a purchasing program with a number of discount plans aimed at corporate buyers. The Lotus Passport program will reportedly increase the discount to correspond with the level of commitment a customer makes to Lotus. At the low end of the scale is the Volume Purchase Option — targeted at workgroups and departments — while the high-end Enterprise Option will provide maximum savings to groups standardizing on a suite of Lotus products for 500 or more users.

**UnixWare update hits delay — again**

Novell, Inc. has delayed until the fourth quarter delivery of its UnixWare 2.0 symmetrical multiprocessing server software. Analysts said delays of the product date back to 1992 and speculated that Novell may be taking extra care after users complained that the firm shipped UnixWare 1.0 with too many software bugs. Novell shipped about 35,000 copies of UnixWare 1.x last year, analysts said [CW, Jan. 10].

**ASK Group meets user promises**

Despite financial setbacks and a recent layoff, The ASK Group, Inc. made good last week on promises to open its Ingres database and development tools to support competing databases, such as those from Oracle Corp. and Sybase, Inc. Now shipping is OpenIngres, a version of the Ingres relational database that can fetch and use information stored in rival databases. OpenRoad, a set of development tools also designed to work with non-Ingres databases, is due to ship late this month, the company said.

**Wal-Mart downsizes EDI**

As part of its companywide business systems re-engineering effort, Wal-Mart Stores, Inc. plans to migrate its mainframe-based electronic data interchange (EDI) program to an open systems environment. Wal-Mart has more than 5,000 EDI trading partners. The yearlong project will kick off with Unix-based EDI gateways next month.

**Intergraph rolls out Pentium machines**

Intergraph Corp. in Huntsville, Ala., announced last week a line of Intel Corp. Pentium-based desktop workstations compatible with Microsoft Corp.'s Windows NT and Windows 3.1. The three workstations use single or dual 90-MHz Pentium CPUs. The move by Intergraph, which has sold workstations based on its Clipper RISC chips for years, may precede NT-compatible announcements from other workstation vendors, said Jeffrey Canin, a research analyst at Salomon Brothers, Inc. in San Francisco.

**Videoconferencing activity picks up**

Compaq Computer Corp. has entered into an agreement with PictureTel Corp. in Danvers, Mass., to build videoconferencing products for desktop computers. The partnership coincides with two other announcements: FTP Software, Inc. and ViewPoint Systems have announced a similar pact, and Optibase, Inc. has formed a subsidiary to sell its desktop videoconferencing product.

**SHORT TAKES** NASA has awarded a three-year, \$22 million contract to IBM, Boeing Computer Services and five other companies and universities to develop ways to use scalable parallel computing in aeronautics. . . . Gupta Corp. got hit with a class action lawsuit last week, filed by angry shareholders who accused the Menlo Park, Calif., vendor of breaking securities laws from November 1993 through last month. Gupta plans to fight the suit.

# AT&T/Novell net debuts

Will new public net be better than Internet?

By Ellis Booker and  
Elisabeth Horwitz  
CHICAGO

Plans announced last week by AT&T Corp. and Novell, Inc. to construct a public network service based on Novell's NetWare promise to extend NetWare into the wide area and could quickly promote electronic commerce, industry analysts said.

But users are cautiously eyeing the as-yet-unknown price of AT&T NetWare Connect Services, wondering what services it will attract and how much they are willing to pay for them.

**A first step**

"The first thing this does is help people understand that the existing Internet is not the information superhighway," said Janet Hyland, director of network strategy research at Forrester Research, Inc. in Cambridge, Mass.

The plan calls for AT&T NetWare Connect Services to use Novell's NetWare Directory Service to provide intra- and intercompany user communities with transparent, secured access to applications and other networked resources.

The NetWare Connect service, which will be tested later this year and is expected to be released in the first half of 1995, will support both Novell's IPX and the Internet's TCP/IP protocols.

The first application planned for NetWare Connect is AT&T Network Notes, which was announced in March. Network Notes envisions public servers on AT&T's network running Lotus Development Corp.'s Notes groupware system.

**Plethora of potential**

Potential applications for the service include connecting health insurance providers to clinics and hospitals as a way of sharing up-to-date patient data for billing, or linking retailers with their suppliers and trading partners.

While value-added networks have offered similar services for years, these solutions have been highly specialized — often implemented on a point-to-point basis.

By comparison, NetWare Connect promises to seamlessly extend the familiar NetWare look and feel to a wide-area network. Users would log on to distant hosts as

easily as they access a server down the hall today.

Wade Brown, chief executive officer at Chicago-based Washington National Insurance Co., said the AT&T/Novell network could serve as a vehicle for a number of projects — including electronic data interchange — now in the

deal because it will employ Novell's proprietary technology rather than work with the rest of the industry to support directory and naming standards.

The service will interoperate with X.400- and X.500-based services via Novell's directory mapping utility, a spokesman said.

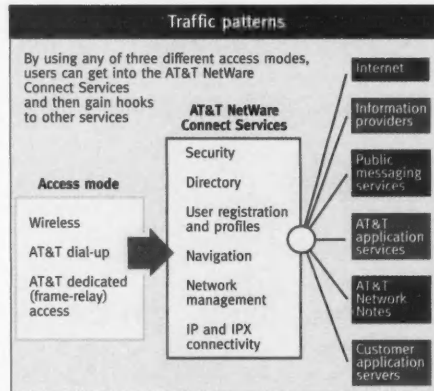
While many businesses today are poking around on the Internet, still more have been put off by its peculiarities.

"Corporations want an environment where they can share and access [information] in a controlled and accountable manner," said Bill Moroney, executive director of the Electronic Messaging Association in Arlington, Va. "That's not possible the way the Internet is set up now."

AT&T and Novell officials did not explicitly compare NetWare

Connect to the Internet, but they stressed that the service would emphasize ease-of-use, predictability, quality performance and security — all areas that the Internet has been criticized for.

Some users were critical of the



## California first on bandwagon

CommerceNet, the first large-scale implementation of electronic commerce on the Internet, was launched a month ago by a group of California companies and is already up and running.

CommerceNet is funded with a three-year, \$6 million grant under the federal government's \$455 million Technology Reinvestment Program. The money is being matched by the state of California and commercial backers, including prominent Bay Area technology firms such as Apple Computer, Inc. and Sun Microsystems, Inc.

Supporting CommerceNet's operation are BARRnet, the primary Internet access provider in the Bay Area; Enterprise Integration Technologies (EIT), an Internet applications developer and consultancy; and Stanford University's Center for Information Technology.

About three dozen commercial businesses, mostly in the San Francisco area, have expressed interest in CommerceNet, said Jay M. Tenenbaum, chairman and founder of EIT, which manages CommerceNet. Plans are under way to replicate the system in other high-tech regions of the U.S., he added.

Lockheed Missiles & Space Co. in Sunnyvale, Calif., for example, is interested in CommerceNet as a way to collaborate with its suppliers and business partners. "About 60% to 70% of the work we do is with business partners, suppliers and subcontractors," said Ram Sriram, project manager at Lockheed.

Access via Integrated Services Digital Network lines (a 128K bit/sec. connection) is expected to cost \$150 a month. To join CommerceNet as a sponsor and use the hub as a pointer to your server elsewhere on the Internet costs \$35,000.

—Ellis Booker

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## Digital

CONTINUED FROM COVER 1

ees. "In fact, the entire enterprise could be at risk."

- Disinvest from markets that are not essential to the company's success.
- Return to profitability by the end of the calendar year.

"The board of directors expects it. And

I expect us to deliver it," Palmer said.

While Palmer would not say which parts of the business were spin-off candidates, he did indicate that he has identified specific targets.

For instance, he said he would consider disbanding any business that conflicts with the company's intended move to indirect channels, particularly in the software arena.

In terms of finding an appropriate buyer, Palmer said a number of "boundary

conditions" have not been met: a fair price, confidence that customers will be serviced well and a positive outcome for Digital employees.

Analysts could only speculate about which areas it would be advantageous for Digital to jettison and attractive for a prospective buyer to purchase.

"The asset of greatest value is Fab 6," said Chris Christiansen, an analyst at International Data Corp. in Framingham, Mass., referring to Digital's state-of-the-

art manufacturing facility in Hudson, Mass. "But it would be like selling your own children."

Another potential target is "anything that requires extensive support" — such as certain software applications, said Terry Shannon, an analyst at Illuminata in Hollis, N.H.

Other spin-off possibilities, analysts speculated, include the profitable storage business, Digital's consulting business or even its direct sales force.

Digital already uses "Digital-authorized agents," Shannon said. These are essentially ex-Digital salespeople who work on commission to sell Digital products.

In terms of other actions, Palmer said he would grant more autonomy to selected business units, where "the vice president will have real line of sight as to assets and control of engineering, marketing, manufacturing and selling." Where it makes sense, he added, these units will have their own sales force.

### Under scrutiny

Digital CEO Robert Palmer denied that the board of directors had given him a time frame for turning the company around. However, he did say, "My job, like any other employee's job, is under ongoing evaluation by the board."

### Focusing investments

In his memo to employees, Palmer linked this greater autonomy to his intention to focus the company's investments. The marketplace "is demanding a strong focus in those market segments in which a company chooses to do business," he said.

Palmer also acknowledged that Digital's corporate culture has not fully made the transition to providing open client/server solutions.

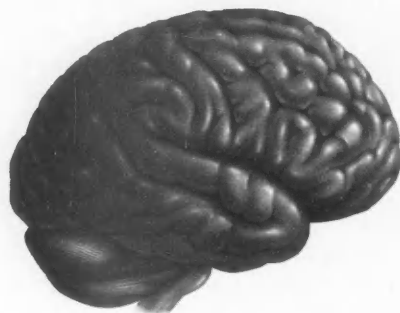
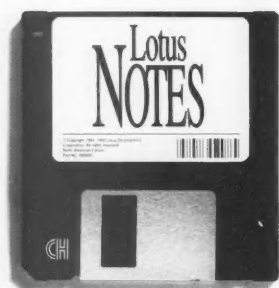
"There are people in the company at all levels that are not yet inculcated with this new [open client/server] philosophy," he said. "The most important part of my job is to help our culture make that transformation."

Palmer told employees to expect "a more directive, decisive, top-down management style."

In a letter sent to Digital senior management, he urged the end of "endless debates" and asked managers to "act as a team ... and eliminate the confusion that frequently accompanies us in the marketplace. I'm holding you accountable for ... putting this great company back on the right track."

In the meantime, Palmer said the company's financial performance should not affect customers' willingness to buy. "Customers don't buy financials. They buy products and services," he said.

Martha Jamgochian, manager of client services at Dunkin' Donuts, Inc. in Randolph, Mass., said she agreed with Palmer. But she said she also considers Digital a business partner, and as such, "I'm concerned not only with their ability to survive but to flourish."



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|--|---|--|--|
| KnowledgeWare, Inc.<br>(Information Engineering<br>Workbench) 42%    | Micro Focus<br>(Workbench) 38%                                      | Micro Focus<br>(Workbench) 29%                                       | Micro Focus<br>(Workbench) 30%                                       |
| Micro Focus<br>(Workbench) 40%                                       | KnowledgeWare, Inc.<br>(Information Engineering<br>Workbench) 17%   | Texas Instruments<br>(Information Engineering<br>Facility (IEF)) 26% | KnowledgeWare, Inc.<br>(Information Engineering<br>Workbench) 14%    |
| Intersolv<br>(Accelerator) 15%                                       | Intersolv<br>(Accelerator) 9%                                       | KnowledgeWare, Inc.<br>(Information Engineering<br>Workbench) 24%    | Intersolv<br>(Accelerator) 11%                                       |
| Texas Instruments<br>(Information Engineering<br>Facility (IEF)) 13% | Computer Associates<br>(CA-Realia) 8%                               | Computer Associates<br>(CA-Realia) 5%                                | Texas Instruments<br>(Information Engineering<br>Facility (IEF)) 11% |
| Computer Associates<br>(CA-Telon) 7%                                 | Visible Systems Corp.<br>(Visible Analyst Workbench) 8%             | Cadre Technologies, Inc.<br>(Teamwork) 3%                            | Computer Associates<br>(CA-Realia) 5%                                |
| Computer Associates<br>(CA-Realia) 6%                                | Texas Instruments<br>(Information Engineering<br>Facility (IEF)) 4% | Intersolv<br>(Accelerator) 3%  | Visible Systems Corp.<br>(Visible Analyst Workbench) 5%              |
| Intersolv<br>(VSDesigner) 3%   | Cadre Technologies, Inc.<br>(Teamwork) 2%                           | Computer Associates<br>(CA-Telon) 2%                                 | Cadre Technologies, Inc.<br>(Teamwork) 4%                            |
| Sylase<br>(CA-Realia) 1%   | Intersolv<br>(Accelerator) 1%                                       | Sylase<br>(CA-Realia) 1%   | Intersolv<br>(Accelerator) 1%  |

Question: For each of the DOS-based CASE software listed, please indicate which  
company you most closely associate with each characteristic:

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• Best service/support • Best documentation • Prefer to do business with

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| BEST SERVICE/<br>SUPPORT   | BEST<br>DOCUMENTATION   | PREFER TO DO<br>BUSINESS WITH  | PLAN TO BUY  |
|--|---|--|--|
| KnowledgeWare, Inc.<br>(Information Engineering<br>Workbench) 26%    | Micro Focus<br>(Workbench) 34%                                      | Micro Focus<br>(Workbench) 28%                                       | Micro Focus<br>(Workbench) 50%                                       |
| Micro Focus<br>(Workbench) 26%                                       | KnowledgeWare, Inc.<br>(Information Engineering<br>Workbench) 31%   | KnowledgeWare, Inc.<br>(Information Engineering<br>Workbench) 23%    | KnowledgeWare, Inc.<br>(Information Engineering<br>Workbench) 29%    |
| Texas Instruments<br>(Information Engineering<br>Facility (IEF)) 19% | Intersolv<br>(Accelerator) 10%                                      | Texas Instruments<br>(Information Engineering<br>Facility (IEF)) 19% | Texas Instruments<br>(Information Engineering<br>Facility (IEF)) 16% |
| Intersolv<br>(Accelerator) 10%                                       | Texas Instruments<br>(Information Engineering<br>Facility (IEF)) 7% | Intersolv<br>(Accelerator) 6%  | Intersolv<br>(Accelerator) 5%  |
| Cadre Technologies, Inc.<br>(Teamwork) 3%                            | Computer Associates<br>(CA-Realia) 3%                               | Computer Associates<br>(CA-Realia) 4%                                | Cadre Technologies, Inc.<br>(Teamwork) 3%                            |
| Computer Associates<br>(CA-Realia) 3%                                | Sylase<br>(CA-Realia) 3%  | Computer Associates<br>(CA-Realia) 4%                                | Computer Associates<br>(CA-Realia) 3%                                |



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# Coalitions inch standards forward

## Document management specification completed

By Ellis Booker  
CHICAGO

The Open Document Management API (ODMA) group will publish its first application programming interface (API) specification on June 27, members of the industry group said last week.

The ODMA, formed earlier this year, includes members from a mix of document management, imaging and database companies, including Interleaf, Inc., WordPerfect Corp. and Oracle Corp.

### Need for standard accelerated

"Anything that provides some interoperability will be a welcome relief," said Thomas M. Kouloupoulos, president of Delphi Consulting Group, Inc. in Boston. He said the proliferation of electronic documents has accelerated the need for such an industry standard. However, he added that significant real-world impact of the effort would be two years away.

The high-level API, based on the Windows Dynamic Link Libraries, will sit be-

tween a desktop application and document management systems. The act of saving a document will launch an associated management system.

"The first release is for Windows, but Macintosh and [the Open Software Foundation's] Motif releases are planned," said Larry Warnock, director of market development at Documentum, Inc., a document management vendor in Pleasanton, Calif. The group is also looking at an API to similarly workflow-enable document management systems.

Documentum, a member of the ODMA, is also on the Shamrock coalition, a group of vendors and large user organizations formed earlier this year to develop an API for exchanging document objects among document management repositories from different vendors.

The two groups have discussed formally coordinating their activities but have no plans to merge, Warnock said.

## Framework for workflow automation unveiled

By Lynda Radosevich

Taking the first major step since its launch last August, the Workflow Management Coalition last week unveiled a framework for developing standards for the interoperability of workflow products across enterprises.

The coalition comprises the leading workflow vendors, systems integrators and large-user companies. With more than 60 firms represented, observers said the framework agreement is an encouraging move toward automating workflow processes across multivendor systems.

"They have a shared vocabulary, so they know what a 'rule' means and what a 'task' means," said Ronni Marshak, a vice president at Patricia Seybold Group in Boston. "In a lot of these groups the language is almost a religion, so this is a big step forward."

However, the coalition still faces the

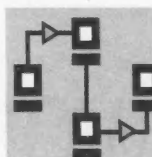
larger challenge of pounding out the technical details, Marshak added.

The framework calls for standards that provide the following:

- A common set of process definition parameters through which users define workflow.
- Interoperability so that multiple products can share management of the workflow process.
- Access to external tools such as electronic mail and document retrieval.
- An application programming interface for creating client and service hooks.
- Common methods for collecting audit information.

In another positive step, membership has grown by roughly 40 to include key vendors such as Microsoft Corp. and FileNet Corp.

"We have such a variety of systems in our environment that the multivendor support—especially Microsoft's—is important," said a messaging manager at a large New York power company who asked to remain anonymous.



Client/server

## Symantec tool aids processing

By Melinda-Carol Ballou

Seeking to address the needs of corporate developers who are hitting a wall trying to create complex, client/server applications with existing tools, Symantec Corp. will next week announce Enterprise Developer.

Based on technology that Symantec acquired in January along with Rapid Enterprises, Inc., the Windows-based visual tool offers a fourth-generation scripting language, integrated reporting, team development and a repository manager. It maintains a centralized repository for creating and storing an information model of

data locations and business rules.

### Faster, easier

The tool automates client/server processing across corporate and desktop databases, which means less training and faster application production for developers, company sources said.

While the current crop of client/server tools need developers with considerable database expertise in hard-coding transaction processes, enforcing business rules and interacting with multiple databases, Symantec's Developer handles that automatically, industry analysts said.

"Tools like [Gupta Corp.'s] SQL Windows or [PowerSoft Corp.'s] PowerBuilder were developed in the mid-to late 1980s, before the issues of working with client/server database servers were well-understood," said Rich Finkelstein, president of Performance Computing, Inc., a Chicago consultancy. With those tools, "you have to do a lot of programming to create the logic to work with the back-end database."

One advantage of the tools, Finkelstein said, is that

they embed much of the logic needed to access and navigate databases. This saves developers from doing it themselves, and applications are appropriately designed and executed.

"In many cases, client/server applications were developed incorrectly [with first-generation tools] and even corrupted databases because these issues were

not well-understood," Finkelstein added.

Symantec's tool has three main components: the Scalable Architecture for Large Enterprise (Scale) Repository, the Scale Transaction Processor and the Scale Data Links. The Repository stores the logical data model, business rules and data locations. The Transaction Processor manages relationships among the data elements in the application to automate queries and update transactions. Data Links provides direct, optimized links to IBM's DB2, Gupta's SQL Server and relational database management systems from Oracle Corp. and Sybase, Inc.

## UB sets new pricing standard for ATM

By Stephen P. Klett Jr.

LAS VEGAS

Ungermann-Bass, Inc. last week laid out an Asynchronous Transfer Mode (ATM) strategy aimed at making the technology more affordable for the masses.

The framework for UB's "ATM AnyWhere" strategy is the GeoSwitch — a full-duplex 155M bit/sec. switch priced at \$955 per port. This is roughly half the price of UB's nearest competitor, Fore Systems, Inc., which announced a price cut of nearly 50% across its ATM product line last month.

GeoSwitch is positioned as either a workgroup or campus backbone switch and is the first of UB's upcoming modular family of ATM products. The switch has an aggregate throughput of 5G bit/sec. and is available with four to 16 ports. Prices range from \$9,990 to \$15,920.

### Phase one

GeoSwitch marks the first phase of ATM AnyWhere and will be followed by ATM adapter cards for Sbus, Extended Industry Standard Architecture and Peripheral Component Interconnect-based systems. Also coming is software that will allow users to manage the switches under NetDirector, UB's network management platform. Advanced systems management capabilities and

higher-speed switches, such as a 622M bit/sec. switch will appear next year, company officials said.

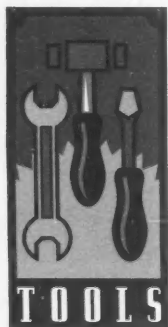
The four-port GeoSwitch allows users to add ATM to their networks in small steps, connecting individual workgroups of power users one at a time. Users can then add additional four-port or higher switches as needed.

Also, GeoSwitch can be used in conjunction with UB's LightStream 2010 backbone switch to gradually build enterprisewide ATM networks in affordable increments, said Roel Pieper, president and chief executive officer of UB.

"This strategy makes a lot of sense because users are not going to want to rip out everything to put in an enterprise hub, for example, to move to ATM," said Michael S. Rothman, an analyst at Meta Group, Inc. in Reston, Va. "ATM AnyWhere may be a trite way of putting it, but it's exactly what a switch like this allows."

However, for at least one user, there is still a long way to go before ATM has a place, anywhere, on his network.

"One thousand dollars a port is better, but it has to get down close to current Ethernet prices before my boss will even consider letting me install it," said a network engineer at a West Coast bank who asked not to be identified. "A lot remains to be proven in the standards and interoperability areas," he added.



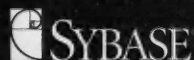
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# Sybase one-ups rivals with middleware

Makes client/server easier to swallow

By Kim S. Nash  
SAN JOSE, CALIF.

With the announcement last week of a set of gateways for linking client/server users to 20 relational and nonrelational databases, Sybase, Inc. may have rolled out the most robust line of middleware available from a single vendor.

The Enterprise Connect series includes several new products built by Sybase and gateway maker Micro Decisionware, Inc., which Sybase bought for \$25 million last month. Sybase also jiggered gateways that the firms built independently to make them more compatible with one another, officials said.

Gateways, which sit between PC users and relational or nonrelational databases, usher queries to chosen databases to retrieve requested data.

The Sybase gateways — priced from \$14,000 to \$160,000 depending on number of users and CPU size — will open more lines of communica-



## Due dates for new gateways

Open Server for IMS is due to ship next month, with OmniSQL Toolkit and database access modules due in the third and fourth quarters, respectively. Turnkeys are available now.

tion between mainframe systems and newer client/server applications, users said. Such middleware cannot come soon enough, said Ian MacFadyen, a technology vice president at Chemical Banking Corp. in New York.

Client/server applications "are causing more demand for more kinds of database" access, MacFadyen said. "These gateways can make that happen."

## Selling to everyone

Sybase aims to sell Enterprise Connect to anyone, regardless of whether they run Sybase SQL Server databases. Sybase's nearest rival in this arena, Information Builders, Inc., may fall behind Micro Decisionware, said Donald DePalma, an analyst at Forrester Research, Inc. Information Builders' EDA/SQL line "will have far less appeal" because it lacks tools for managing gateways, unlike Enter-

prise Connect, he said. Information Builders plans to address systems management next month, a spokesman said.

Key pieces of Enterprise Connect include the following:

- Open Server for IMS, which gives client/server implementers read-and-write access to IBM mainframes. IMS is a widely used transaction monitor from IBM.
- OmniSQL access modules, a set of links to 20 specific databases, 14 of which are new, such as one to Informix Software, Inc.'s OnLine. Access modules to four hierarchical mainframe databases are available via Trinzix Corp., a Sybase partner.
- OmniSQL Toolkit, a tool set

for creating custom access modules.

● Turnkey gateways, direct links between specific databases, such as Software AG of North America's Adabas to Oracle Corp.'s database.

"Some of our competitors treat the mainframe as if it will disappear."

—Bob Epstein,  
chief technology  
officer,  
Sybase, Inc.

## IBM PC Co. retrenches

CONTINUED FROM COVER 1

analyst at a large Midwestern medical products manager. He recalled the days when IBM had "20 layers of bureaucracy," which made it slow to respond to market needs.

One of the factors behind the departure of Corrigan, a 32-year veteran, was thought to be his possible difference of opinion with IBM's PowerPC group over implementation of the PowerPC chip, in which IBM has invested more than \$1 billion. Another issue was Corrigan's commitment to Intel Corp. architecture, industry sources said.

"It was work together or else. If you think you are going to run your own business, you're wrong," said a well-placed source at IBM.

Corrigan could not be reached last week for comment.

## Losing steam

Also at issue, some observers noted, are signs that the high-profile recovery Corrigan helped engineer for IBM's PC business may have lost some of its early momentum. Analysts and users agreed that the company faces immediate technical and marketing challenges.

Those include a persistent inability to forecast or meet demand in several product lines, overlapping and positioning problems across its desktop range and a seemingly nonexistent server strategy — all of which have underscored the company's recent problems (see chart).

IBM acknowledges that it has availability problems, especially with its higher-end PS/2 products. The delay to market has cost IBM in both market and mind share, analysts said. The long-awaited refreshes to the PS/2 line are likely to be announced as early as two weeks from now, according to one analyst.

"Nobody thinks that IBM is dropping off the market, but the fact is that IBM is under siege on a number of fronts," said Richard Zwetckhenbaum, research manager of the PC hard-



The PC Co.'s Robert J. Corrigan: Replacing him with a four-member team adds a layer of bureaucracy

## IBM slips

In 1993, IBM held 11.6% of the worldwide PC market share, followed by Apple with 10.1% and Compaq with 8.5%, according to International Data Corp. Preliminary figures available from IDC reveal that so far in 1994 IBM trails its rivals, with first-quarter unit sales of 840,000, compared with 970,000 for Compaq and 845,000 for Apple.

ware program at International Data Corp. (IDC) in Framingham, Mass.

IDC's preliminary PC sales figures for the first quarter indicate that IBM has slipped to third place in the industry, behind Compaq Computer Corp. and Apple Computer, Inc.

## Slow growth

While companies such as Compaq, AST Research, Inc. and Gateway 2000, Inc. grow every quarter, IBM's growth has been less spectacular. The PC Co.'s first-quarter sales reflect a 6% increase over the same period last year.

However, IBM could still lead the market in share this year because historically most of its sales have come in the fourth quarter. It had sales of 1.6 million units in the fourth quarter of 1993, compared with Compaq's 937,000.

"IBM needs to get a handle on problems such as supply, product proliferation and competing product lines," Pinkard said. For instance, a plethora of IBM's similarly positioned ValuePoint PCs and erratic availability have created confusion in the commercial marketplace. And that has driven customers to other vendors, the user said.

Robert A. Haas, manager of corporate information systems at Interco, Inc. in St. Louis, has already switched from being an all-IBM shop to a nearly all-Compaq shop. He made the transition, he said, for two reasons: the much higher cost of competing IBM machines and a certain IBM attitude. "They were telling me what to do, instead of listening to what I wanted," he said.

## Under one roof

IBM expects its new structure for the PC Co. to address some of these issues. The PC Co. will integrate all finance, management, manufacturing, branding, marketing and procurement functions into a single worldwide organization under the four general managers and Thoman.

By directly linking customer fulfillment goals with sales and marketing and by tying development functions to procurement and brand man-

| A hard row to hoe   |    |
|---|----|
| WHICH OF THE FOLLOWING WOULD YOU MOST LIKE TO SEE THE IBM PC Co. IMMEDIATELY ADDRESS? |    |
| Miscalculated desktop PC demand, which has resulted in erratic availability           | 40 |
| Pricing structure   | 22 |
| Delays in bringing products to market   | 18 |
| Overlap among multiple product lines  | 13 |
| Develop PowerPC products sooner   | 12 |
| Backlog of ThinkPad notebooks   | 6  |
| Clarify branding strategy   | 3  |
| Build-to-order business   | 2  |
| More "added value" to systems   | 1  |
| BASE: 117 IBM PC USERS  |    |

Source: Computerworld Database Division, Framingham, Mass.

agement, IBM hopes to streamline decision-making and respond more quickly to market demands, said Bruce Claflin, the PC Co.'s newly named general manager in charge of product and brand development.

On the cost front, the PC Co. is expected to quietly drop prices on its ValuePoint lines in a bid to get rid of the inventory that is piling up in the reseller channel, according to the president of a large value-added reseller, who asked not to be named. The backlog is one reason IBM recently delayed four new ValuePoint products.

IBM is also considering adopting a new branding strategy aimed at easing some of the product overlap and conflict at the corporate desktop end.

Claflin also said that by the third quarter, almost 80% of the PC Co.'s products would be built to order, instead of built to plan.

The PC Co.'s first-quarter sales reflect a 6% increase over the same period last year.



## Intel

CONTINUED FROM COVER 1

systems makers. Some said Intel's abrupt shift in focus means they will be unable to fill orders for 100-MHz DX4-based systems for some time.

This may lead more vendors to use chips from Intel competitors. Otherwise, the impact on users should be slight, industry observers said.

Users, in fact, said they were pleased by the development.

"If performance and price is the same, why not" buy the Pentium? asked Tom Balzarini, PC coordinator at Associated Grocers, Inc. in Seattle.

Desktop suppliers, meanwhile, were less than happy. Sources at several OEMs said Intel has broken promises made to them on delivery of the DX4.

For example, an Intel spokeswoman's insistence that "we are meeting our commitments as we put them in writing" prompted a source at one PC maker to comment, "Ask them what they mean by commitments. They keep decreasing their commitment to us."

But the spokeswoman maintained that Intel was not having unusual problems manufacturing the 100-MHz DX4; rather, the company would prefer to focus its DX4 manufacturing efforts on the portable-oriented 25/75-MHz DX4, she said.

**Trouble brewing?**

Several reports have suggested that the 60-MHz Pentium may face availability problems. But Martin Reynolds, an analyst at Computer Intelligence/InfoCorp, said the move to Pentium must mean Intel is getting much better yields on Pentium than it had expected.

In the 486 market, Intel is vulnerable to competition from Advanced Micro Devices, Inc., Cyrix Corp. and others.

Sources at hardware makers said Intel made several moves recently that point to a de-emphasis of the 486 and some possible problems that may result from a hasty move to Pentium. They said Intel has done the following:

- Cut third-quarter pricing on all its high-end chips except the 100-MHz DX4.
- Told vendors that availability of the 100-MHz DX4 will be constrained through year's end and that the 60-MHz Pentium will become its mainstream volume processor.
- Told vendors that a 75-MHz version of Pentium has been canned, meaning that Intel will have no midrange Pentium offering. Users who want something faster than the 60-MHz chip but less expensive than the 60/90-MHz chip have no options.

This could hurt the company in the short term if AMD and Cyrix are able to produce their upcoming high-end 486 clones in volume.

- Told customers it is having some problems building the "real" Pentium, the 60/90-MHz and 66/100-MHz chips code-named P54C.
- Not provided plans for the P24T, the chip that was supposed to be used to upgrade a number of 486 systems to Pentium performance. This casts doubt on

whether Intel will ship the chip this year.

Intel declined to comment on pricing but said it would release a 75-MHz version of Pentium in the third quarter and will ship the P24T before year's end.

**Looking elsewhere**

The 60-MHz Pentium barely outperforms the 100-MHz DX4 and could be outstripped by AMD's 40/120-MHz 486, for example, which is scheduled to ship in the second half of the year. Intel would

have nothing to counter this chip's price/performance ratio, a circumstance that could give AMD an entree into systems makers currently loyal to Intel.

"We might have to consider going outside Intel," said a source at one large PC maker, who asked not to be named.

"I don't care who makes it so long as it works. Our comfort level with Intel is much higher than with the others, but we do look at products from alternative manufacturers. And where price is sen-

sitive — and it is in all our purchases — those will be considered," said John Woods, a PC systems specialist at Chevron Information Technology Co. in San Ramon, Calif.

The vendor headaches, meanwhile, may slow availability as the companies scramble to shift from the 100-MHz DX4 to the 60-MHz Pentium. Analysts said they expect most vendors to simply offer 33/66-MHz DX2 chips until they gear up 60-MHz Pentium production.

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## DMV

CONTINUED FROM COVER 1

pointing by vendors and consultants ran rampant. Even the DMV's information systems executives lined up for their share of the blame.

"There's a silent crisis, but it isn't as if we were about to run into a brick wall," said Glenn Wilson, the DMV's manager of IS, who was appointed last year to clean up the project.

Re-engineering the department may now precede any rewrite of the DMV's on-line transaction system.

"Our director would like to modernize our business practices and then build our [information technology] support around them," Wilson said, referring to DMV director Frank Zolin, who came on board in mid-1991. Failing to analyze business processes "was one of the flaws in the original project," he added.

## Passing the buck

There is plenty of blame to go around.

Tandem Computers, Inc., which supplied nearly \$20 million in computer hardware and relational database software, said last week it had fulfilled its end of the bargain. "The database is loaded and is spinning, but there is no application accessing that database," said Bruce Dougherty, Tandem's vice president of solutions marketing.

Tandem blamed the failure on poor project management by the DMV and on the 1990 withdrawal of former project manager Ernst & Young. In turn, Ernst & Young said it left the project shortly after

it started. "We did not agree with the DMV on the future direction of the project," said spokesman Mort Meyerson. "Our involvement was less than a year."

Meanwhile, with no replacement in sight, the DMV—which tracks 50 million vehicle registrations and driver's licenses and collects \$5.2 billion in taxes and fees yearly—is making do with ancient technology (see story at right). The system, which handles 1 million transactions a day, is built on assembler code, software patches, dumb terminals and

fully understand what that would mean," he said. "Strike three was our inability to get an operational system."

After Ernst & Young's departure in 1990, a team of DMV staffers took over and tried to develop applications using Texas Instruments, Inc.'s Information Engineering Facility computer-aided software engineering (CASE) tools. But a steep learning curve for the tools burdened the team, Wilson said. "It was going to be a significant factor on the cost to complete the project," he added.

California government IS staffers disagreed, saying the DMV team started with upper-level CASE planning and analysis but failed to generate usable code.

One site that uses the DMV's on-line system with few problems is the Automobile Club of Southern California, which has 5,000 terminals tied into the DMV's mainframes. "As long as they're providing us with what we need, I don't care too much how they get it done," said Clark Murray, the club's director of IS. He did say, however,

that the DMV's Series/1 machines do not support enough communications ports.

Now, with the project ending, there is no shortage of second-guessing.

"The real issue is not just CASE expertise but also competent, solid project management because this is a complex project," said Gerald Peterson, Tandem's senior vice president of sales and support. He said he closed the 1989 contract with the DMV after Tandem won a showy and much-publicized benchmark contest against IBM's DB2. "They're mired in their old code, and they couldn't find a way out of that," he said.

## California

**DAUNTING CHALLENGES FOR CALIFORNIA'S DEPARTMENT OF MOTOR VEHICLES INCLUDE THE FOLLOWING:**

- \* Re-engineer business processes throughout the department. Include support for new legislative mandates such as the motor/voter registration program in the new computer systems.
- \* Rewrite assembler "spaghetti" code into Cobol or a 4GL. Maintain subsecond response times.
- \* Move 220G bytes stored in IBM VSAM flat-file databases to a relational database architecture.
- \* Replace roughly 300 aging IBM Series/1 minicomputers—the hubs of DMV's front-end communications system—at regional DMV offices.
- \* Start replacing 40,000 dumb terminals statewide with intelligent PCs.

California  
April '94  
No. 876330

10-year-old IBM Series/1 minicomputers used as mainframe links at DMV offices.

"We're not running out of horsepower," Wilson said, adding that the system is running on an IBM ES/9000 mainframe at the state's Teale Data Center here. "But we do have escalating maintenance [costs], and we do want to control that."

The revamp project had three strikes against it, Wilson said. "Strike one was how we started out, without full enough business reasons for what we needed to do. Strike two was Ernst & Young's withdrawing from the project, and we didn't

## Protocols

CONTINUED FROM COVER 1

of users laboring to administer five or six across the enterprise. "We'd much rather support two protocols than four or five," said Andy Palms, a network analyst at the University of Michigan in Ann Arbor. "Right now we have those two, plus Vines IP, AppleTalk and NetBEUI."

TCP/IP is an efficient and effective internetworking protocol, but "TCP/IP configuration management on the LAN is a bear," said Jamie Lewis, president of The Burton Group in Salt Lake City.

Conversely, IPX is easy to administer over the LAN but kludgy and bandwidth-intensive over WANs, said Chuck Rush, a systems project manager at McDonald's Corp. in Oak Brook, Ill. The problems inherent in TCP/IP and IPX, if not fixed swiftly, "are likely to sneak up on us" as McDonald's networking strategy moves forward, he said.

The good news is some problems are being resolved. The Internet Engineer-

ing Task Force recently came out with Dynamic Host Control Protocol (DHCP), which supports automatic assigning and reassigning of TCP/IP addresses to user nodes. DHCP promises to greatly relieve the "LAN administration burden [that] has been holding back many users from implementing TCP/IP on PC LANs," said David Passmore, president of Decisis, a Herndon, Va., consultancy.

Indeed, given that it takes about 20 minutes to configure TCP/IP on each PC, the new protocol can save large TCP/IP installations a bundle in administration

time, industry sources said [CW, April 4].

The Boeing Co. Computer Services division was so impatient for DHCP that it developed its own DHCP software, two vendor sources said. The Seattle aerospace company expects to save approximately \$2 million a year through the protocol, according to one vendor source.

Sun Microsystems, Inc., Microsoft Corp. and FTP Software, Inc. are among the vendors either promising or delivering DHCP support.

Novell, meanwhile, has been irking its customers by promising but not deliver-

## Signs of support

The industry will coalesce around TCP/IP and IPX with these actions:

- Microsoft will provide 32-bit versions of its TCP/IP and IPX software for the upcoming Windows for Workgroups, Daytona and Chicago releases, with higher throughput com-

pared with the older versions.

- Banyan will provide TCP/IP support for Vines clients by year's end.
- Novell already offers native TCP/IP as well as IPX access to NetWare.
- Apple recently announced it will provide much more direct, efficient TCP/IP support on the Macintosh with System 7.5, due out this summer, and for IPX at a later date.

—Elisabeth Horvitt

## Coming of age

The Beach Boys were still baby-faced back when the DMV's on-line system was hot technology.

The circa-1965 system for on-line driver's licenses and vehicle registration was born on an RCA Corp. computer and today runs on an IBM ES/9000.

But while the hardware upgraded with the times, the software did not. The code for the system is still based on the assembler language.

"To add a Social Security number [record file] to the driver's license file and the vehicle registration file took us 18 programmer years," said DMV spokesman Evan Nossoff.

The 220G bytes of data is stored in old IBM VSAM flat-file databases. Retrieval is quick, but it is impossible to do "what-if" searches.

Two years ago, a version of the driver's license database was transferred to Tandem Cyclone machines, but that is mostly used for police officers' ad hoc queries.

Also missing from a standard IBM CICS transaction monitor.

"We have our own real-time monitor that we developed in the 1960s," said Glenn Wilson, DMV's manager of IS.

DMV managers are most concerned about another aging system element: the 310 IBM Series/1 minicomputers installed in field offices between 1982 and 1985. By 1993, IBM may not support them anymore, and parts are already hard to come by.

—Jean S. Bozman

ing a more routable version of IPX called NetWare Link State Protocol. The protocol, slated for shipment by year's end by both Novell and major router vendors, lets routers notify one another of changes in their subnetwork addresses. This minimizes the need for broadcast messages, according to a Novell spokesman.

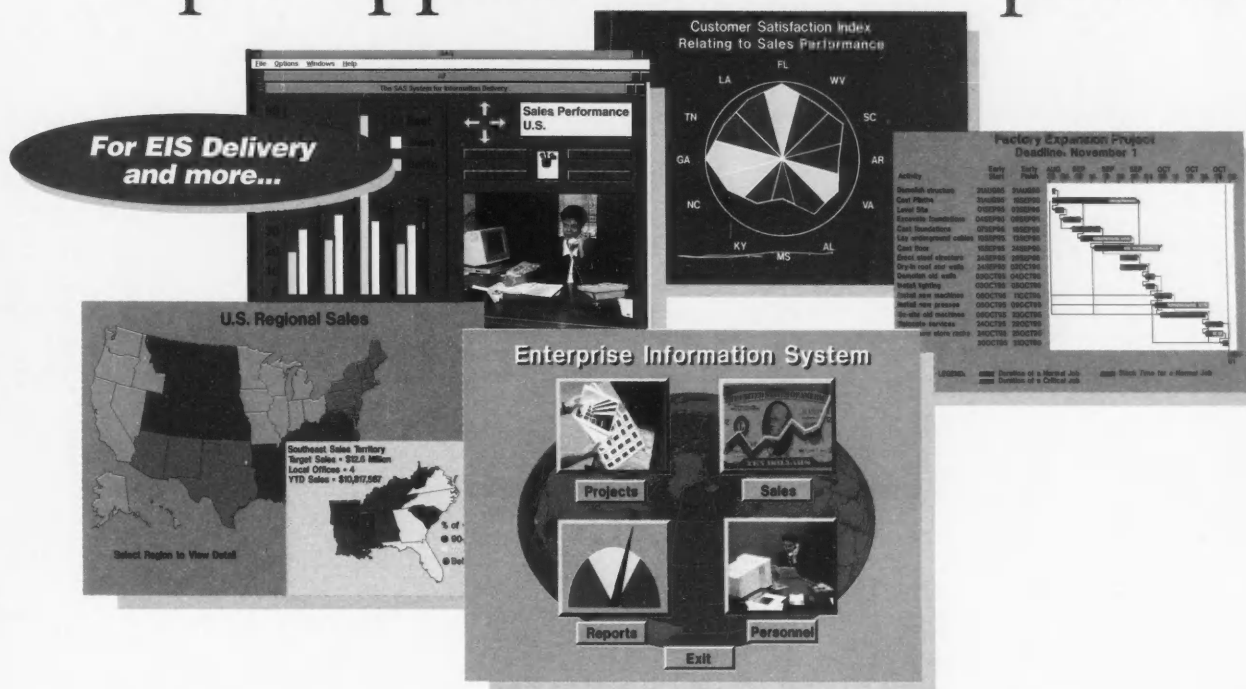
First Security Information Technology, Inc. is one NetWare shop waiting eagerly for the NetWare protocol as a way to limit IPX traffic across the enterprise, said Ken Moerman, a network services manager at the Salt Lake City financial firm.

However, the protocol helps but does not completely fix the problem of IPX traffic, Passmore said.

Microsoft plans to enhance IPX's scalability across the Internet if Novell does not deliver, said J. Allard, a program manager at Microsoft. Indeed, Microsoft is one of the more strategic vendors to recently back the dual TCP/IP-IPX transport standards, promising 32-bit, streamlined versions of the two protocols on its Chicago, Daytona and upcoming Windows for Workgroup releases.



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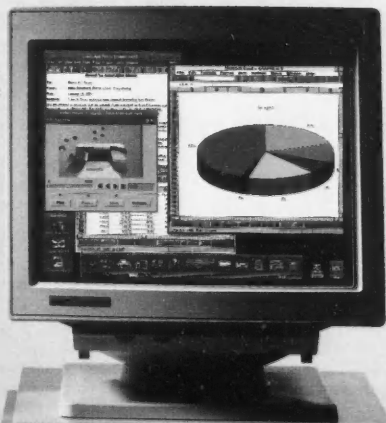
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# IBM to address DB2 users' concerns

Conference will provide specifics on making DB2 databases more compatible

By Kim S. Nash

When the International DB2 Users Group holds its annual conference this week, IBM may find itself on the hot seat regarding incompatibilities among its current mix of DB2 databases.

This year, for the first time, users of the Unix and PC editions of DB2 have been invited to join their IBM mainframe cousins. In all, more than 1,700 DB2 users are expected to gather in San Diego to check out new products from DB2-related independent software vendors and IBM itself.

One issue apparently on the minds of several users who have written on CompuServe recently is the extent to which IBM will merge its disparate databases. Though they all sport the DB2 name, the products are different, said Rob Tholemeier, an analyst at Meta Group, Inc.

There are differences in SQL syntax between, for example, DB2 on the mainframe and DB2/6000 — a product for IBM's Unix-based RS/6000 machine. This makes the IBM option less viable for users looking for a top-to-bottom database solution, Tholemeier said.

At the conference, Steve Mills, general manager of IBM's Software Solutions division, is expected to provide some specifics on IBM's plans for making DB2/2 and DB2/6000 more compatible with the company's tried-and-true DB2 for the MVS operating system.

IBM also plans to preview new releases of DB2/2 and DB2/6000, a spokeswoman said. However, the products are not expected to be announced until the DB/Expo '94 conference slated for the week of May 23 in San Francisco.

Mills, who was appointed to head IBM's Software Solutions division nine months ago, is due to lay out a strategic direction for IBM's DB2 family, as well as specific enhancements for the balance of this year into 1995. Perhaps most notable is IBM's intention to port DB2/6000 to non-IBM systems such as Hewlett-Packard Co.'s HP/UX. Other ports are on the way, a spokeswoman said, although she declined to elaborate.



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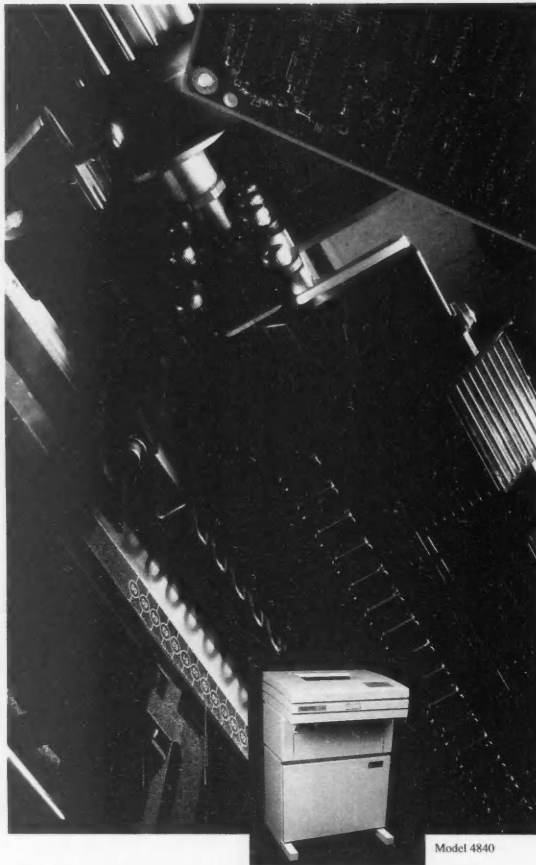
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### At the show

Elsewhere at the show, Landmark Systems Corp. is expected to unveil a new version of The Monitor, also known as Tmon, a performance and applications monitor for DB2 Versions 2 and 3. Release 2.0 of The Monitor is part of a string of management tools for MVS, CICS and Unix operating systems from the Vienna, Va., company.

The upgrade includes a function to translate DB2 performance statistics into SQL format and more easily pinpoint trouble spots in applications. Database administrators can also define alerts where warnings flash if processing speed or other measures fall below a specified range.

Netwise, Inc. in Boulder, Colo., will show its new gateway to shunt data from DB2 to Windows PCs, according to a company insider. TransAccess DB2/Integrator supports Microsoft Corp. Open Database Connectivity standards to let developers and end users access data stored in mainframe DB2.

The product costs less than \$50,000 and is the first in a series of gateway offerings due out this year from Netwise, a spokeswoman said. Similar products for connecting PCs to databases, such as Adabas from Software AG of North America, Inc. and Datacomp and IDMS from Computer Associates International, Inc., are also due out this year.

DataEase International, Inc. plans to demonstrate a "final beta" version of a gateway designed to connect IBM databases to Unix rivals such as those from Oracle Corp., Sybase, Inc. and Microsoft, a spokeswoman said. The product, SQL Connect for DRDA, or Distributed Relational Database Architecture, is scheduled to ship this quarter, she said.

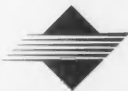


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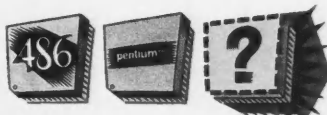
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# Micro Focus works a Cobol transition

By Melinda-Carol Ballou

Cobol programmers seeking to make the transition to object-oriented environments within the familiar embrace of Cobol will soon be able to do so. Micro Focus, Inc. in Palo Alto, Calif., will ship next month its object-oriented Cobol compiler and development environment [CW, Dec.

20, 1993], along with 16- and 32-bit updates to its Workbench tools.

"Moving our Cobol applications in an object-oriented direction will allow us to take advantage of the benefits of reusability, faster development and increased quality," said Joe Garry, a vice president at a Brooklyn branch of The Chase Manhattan Bank NA. "By wrapping existing

code, you could take mainframe Cobol applications and bring them to the object-oriented world."

Also expected to be announced at the company's user conference in San Francisco this week is an upcoming technology that company officials said will provide seamless access via Cobol to the myriad disparate development tools at

major corporate sites.

This new technology initiative, dubbed Tapestry, would offer developers a single graphical interface to those tools and a Cobol or Object Cobol-based scripting language.

## Nothing new to learn

Tools from many vendors require developers to use proprietary scripting languages such as fourth-generation languages. Tapestry makes it unnecessary to learn those scripting languages by letting developers use their Cobol expertise to access tools such as Powersoft Corp.'s PowerBuilder or Microsoft Corp.'s Visual Basic, Micro Focus officials said. It will also support a range of programming languages and offer connections to middleware and on-line transaction processor services, they added.

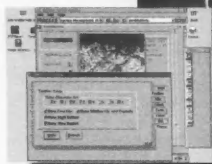
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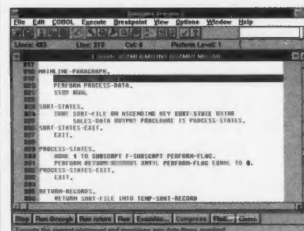
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Building Enterprise Client-Server Applications



**Micro Focus' Animator 2** allows Workbench users to change and access code while it is running

Corporate developers were hopeful about potential benefits.

"The existence of multiple tools is an issue for us," Garry said. "Something like Tapestry might obviate the need for retraining" and provide easier access.

"We have maybe eight or nine different add-on tools related to Micro Focus alone, plus other tools," said Michelle Young, technical specialist at Nationwide Mutual Insurance Co. in Columbus, Ohio. "Tapestry ... could provide an interface to integrate our different tools. But the other issue will be how much they charge for it."

## Moving quickly is key

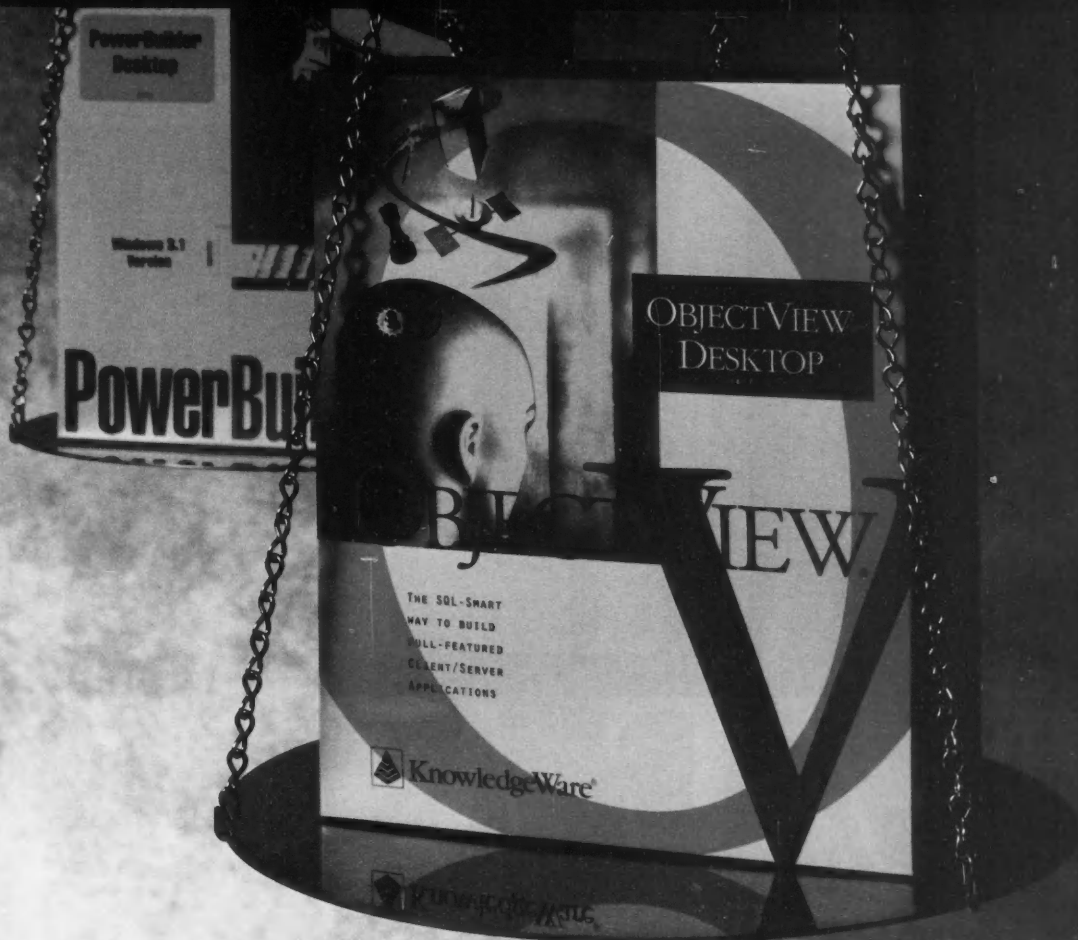
Industry analysts spoke positively about Micro Focus' efforts to move Cobol programmers forward via Tapestry, the object-oriented Cobol products and 32-bit support.

"The Cobol marketplace has taken a tremendous beating, and Micro Focus is ... trying to let those programmers exploit other technologies as well as the desktop," said Kevin Schick, an analyst at Gartner Group, Inc., a consultancy in Stamford, Conn. He added, however, that Micro Focus must move forward quickly to offer product support for key desktop technologies such as Object Linking and Embedding, which is not expected to ship until later this year.

As for the new version of Workbench for Windows and OS/2, Young said what is particularly important for her group is the increased ease of use and improved facilities for Animator 2, a tool that allows Workbench users to change and access code while it is running (see photo above).

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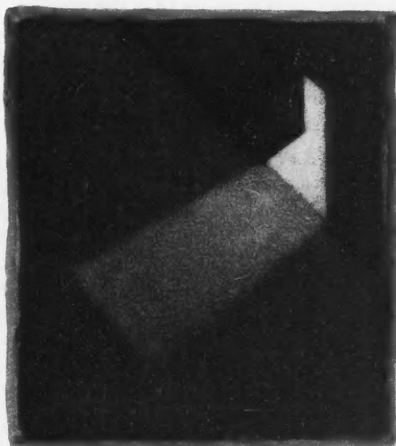
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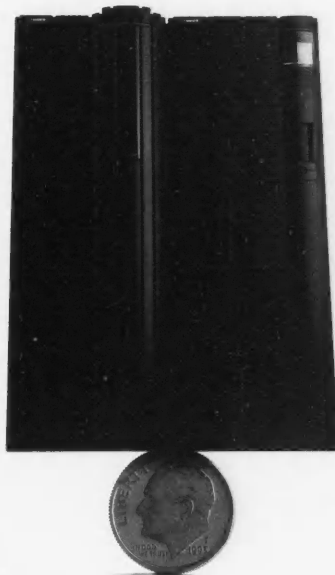
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# Esprit outsources legacy, refocuses IS

By Jean S. Bozman  
SAN FRANCISCO

In an effort to speed its transition to Unix client/server systems and reduce information systems costs, clothesmaker Esprit de Corp. is outsourcing its IBM 3090 Model 200 mainframe and redirecting its IS energies to new applications running on 20 IBM RS/6000 machines.

Industry analysts said last week that Esprit's action is typical of many firms that move from mainframes to client/server systems through a process called transitional outsourcing. Many users shave roughly 15% to 25% off their IS budgets by outsourcing the mainframe and its legacy applications, said Gerald Rydberg, Andersen Consulting's partner in charge of business process management for the Northeast.

For Esprit, "it's a matter of focus for our people," said Pete Bates, vice president of systems at Esprit. The removal of the mainframe from the firm's headquarters "allows our management to refocus their energies on bringing up the new environment, rather than be concerned with the maintenance and operation of the existing environment," he added.

Esprit has roughly 40 IS staffers in the U.S.; worldwide, it has 120 IS staff members. European and Asian operations are based on IBM AS/400 computers.

Many retailers are turning to outsourcing to cushion the transition to a new generation of store-automation systems, said Barbara Anderson, a systems consultant who owns her own firm, BVAC, in San Carlos, Calif. Often, the intent of the outsourcing is to reduce staff, as well as cut hardware and software costs, Anderson said.

## Mainframe costs

More than 80% of a firm's IS budget may be tied up in mainframe hardware costs, personnel, legacy applications and software maintenance, Rydberg said.

Bates said he expects Esprit to reap a 10% savings in the first two years and roughly 25% overall savings if the outsourcing extends beyond three years. His U.S.-based IS staff has already been cut one-third, from nearly 60 three years ago. "We don't anticipate substantial changes from where we are now," he said.

Last month, Esprit said it had agreed to outsource operation of its 4-year-old leased mainframe to Software Maintenance Specialists (SMS) in Santa Ana, Calif., for at least two years. Esprit can then decide whether to extend the contract for mainframe services "for as long as we have to rely on it," Bates noted.

The clothing firm estimates it will need the mainframe applications for the next 24 to 36 months, he said. Bates said he is also willing to consider high-end serv-

ers from Sun Microsystems, Inc. and Hewlett-Packard Co. to host large Unix applications.

Esprit's mainframe-based financial, inventory and distribution applications will run as a logical partition on one of SMS' two IBM 3090 Model 600 mainframes in a data center in La Mirada, Calif. Meanwhile, Esprit programmers will continue migrating applications to IBM RS/6000s running the Sybase, Inc. relational database.

Although some applications have already been rewritten for use on the Unix servers, such as one production management system, Esprit is also shopping for packaged Unix programs. Along with its 20 RS/6000 workstations and servers, the company is using 220 PCs as "client" workstations.

Esprit chose Unix workstations and servers because the company said it believed they were the most cost-effective alternative to mainframe processors.

"We feel increasingly good about the selection we made," Bates said. "We look forward to [the time] when we require the [RS/6000] capacity to be able to get a whole lot more bang for the buck."

# ESPRIT



Esprit's Pete Bates:  
New environment is  
greater priority

# Government security efforts neglect corporate needs

By Gary H. Anthes

The Clinton administration is so influenced by law enforcement and national security concerns that it is neglecting the security needs of the mainstream computer community, users and vendors agree.

The result is that scarce tax dollars are being diverted from badly needed initiatives by an increasingly networked society, observers say. The concerns center particularly on user authentication, global security standards and commercial systems configured for out-of-the-box security.

Recent government security initiatives have focused on protecting the government's ability to intercept and read the communications of spies and criminals—both here and abroad, said Stephen D. Crocker, a member of the Internet Architecture Board and a vice president at Trusted Information Systems, Inc., a computer security consultancy in Glenwood, Md.

## Needed protection

Yet users also need protection, Crocker added, "from each other, from bandits, from systems that break and [from] systems that can be penetrated easily." The government in general, and the National Institute of Standards and Technology (NIST) in particular, has not shown leadership in those areas, he said.

Instead, Crocker noted, the adminis-

tration bans the export of products with strong encryption, pushes relentlessly for the controversial "Clipper" key escrow encryption standard and seeks legislation making it easier to wiretap digital telephone switches.

Security specialists at NIST disagree with that assessment, but they acknowledge they could contribute more to mainstream user security given a bigger budget. Currently the agency allocates just 1% of its \$520 million budget to computer and communications security.

NIST officials also said the huge controversy during the past year over the Clipper initiative has overshadowed other important accomplishments, such as the Automated Password Generator Standard.

Nevertheless, users are urging NIST to be more proactive.

"There is a need for NIST to become a real powerhouse," said Stash R. Jarocki, vice president of corporate audit and business system review at Citibank NA in New York. "If we can come up with standards, that will drive down costs tremendously. And it would put the hackers on notice that we will build robust systems based on good standards."

"Our first responsibility is to federal agencies," countered F. Lynn McNulty, associate director for computer security at NIST's Computer Systems Laboratory.

William Murray, an information security consultant to Deloitte & Touche, said the government's concentration on

trusted operating systems misses the real danger for commercial users.

"We are not having a problem trusting the individual computer to do what it is being told to do," he said. "Our real problems have to do with trusting them in huge networks."

## Developing standards

Prompted in part by Vice President Al Gore's National Information Infrastructure initiative, NIST has begun—and may soon accelerate—efforts to develop a set of interface standards for identification and authentication.

The standards would allow a user to sign on to multiple, dissimilar systems using a single sign-on method and would allow those systems to pass the user's credentials from place to place.

While intended to enable electronic government, those standards will be useful in the private sector, said Stuart Katzke, chief of NIST's Computer Security Division. For example, authentication of a user logged onto a home shopping service could be passed to a bank to trigger payment, he said.

NIST should also take a more aggressive role in educating vendors and users of the need for stronger security in off-the-shelf systems, some users said. "Products come configured in very crude ways so they are very unsafe out of the box," Crocker said. "There's no help from NIST, no leadership, no energy trying to develop standards for when a box

is safe to plug into a network."

Even more government guidance is coming, however. NIST is working with the Information Systems Security Association to develop "Generally Accepted System Security Principles," a set of security features and practices to guide design, use and management of systems. A draft of these high-level principles is due out this fall, Katzke said.

But NIST officials countered that they have issued many guidelines on how to set up networked computers in a secure way—advice often ignored by users more concerned about performance and ease of use.

Some users would like to see NIST take over the trusted operating system evaluations and certifications now done by the Pentagon's National Security Agency. It takes the NSA two to three years to do an evaluation that takes 90 to 180 days in Europe, where private laboratories do the job, Jarocki said.

NIST does hope to wrest from the NSA the responsibility for certifying operating system security at the lower levels of trust, where about 80% of the commercial market lies, Katzke said.

NIST may be shifting its focus away from individual product evaluations—which are tedious and slow—to broader work overseeing vendors' development processes, Katzke said. "The advantage for users is that products coming off the assembly line would already be certified to some level of assurance."



NIST's F. Lynn McNulty:  
Federal agencies are  
first concern



NIST's Stuart Katzke:  
Standards will help  
private sector

## Client/Server Database Solutions

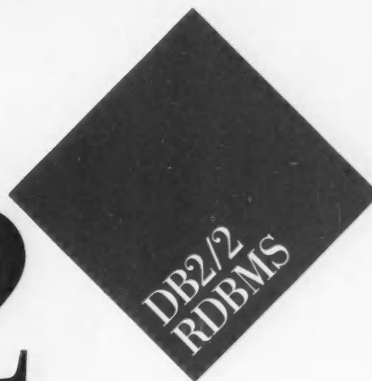
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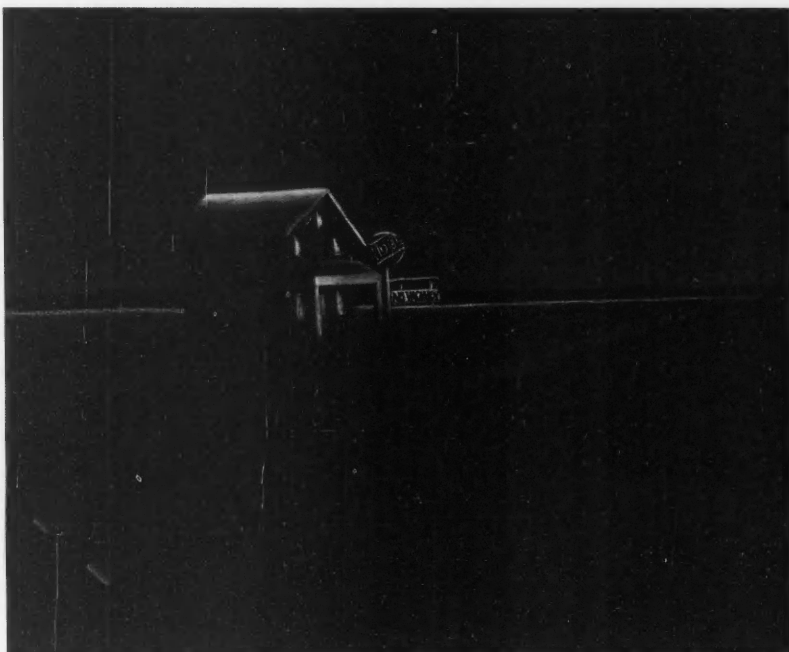
Now, you probably don't have a lot of executives faxing reports from a beach. Or sales people tucking in their babies over airport video phones.

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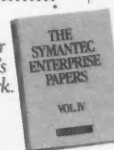
It won't show you pretty pictures of people faxing from a sunny beach.

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# Computer Industry

## Briefs

### Gateway assets sold

Microdyne Corp. said it will acquire from Gateway Communications, Inc. certain assets, including inventory, technology and fixed assets, valued at approximately \$2.4 million. The deal is subject to approval by Gateway shareholders. Affected products include the Ethernut adapter, micro-hubs, WNIM synchronous adapters, LAN Expander, LAN Access Server and stackable 12-port hubs.

### Concurrent sales low

Concurrent Computer Corp. reported \$44.1 million in sales for its third quarter ended March 31, compared with \$56.1 million for the third quarter last year. Income for the third quarter had improved over the previous quarter ended in December, when sales were \$40.7 million with a net loss of \$3.5 million.

### Intellicorp posts loss

Intellicorp, Inc. in Mountain View, Calif., reported a net loss of \$1.5 million for the third quarter ended March 31, compared with a loss of \$705,000 for the same period last year. Revenue was \$2.6 million, compared with \$2.8 million for the same quarter last year. The company blamed a shortfall in license sales, among other factors.

### Kurzweil hit with suit

A class-action suit has been filed against Kurzweil Applied Intelligence, Inc. and the underwriters of its August 1993 initial public offering (IPO) that seeks the rescission of the IPO and restitution to shareholders. The suit charges that the registration statement and prospectus for the IPO, as well as subsequent press releases and public remarks, were false and misleading. The suit was allegedly triggered by Kurzweil's admission two weeks ago that due to possible revenue recognition problems, it expects to post a substantial loss for the fiscal year.

## Object-oriented databases

# Object Design, DEC to team

By Kim S. Nash

Object Design, Inc. is working on an agreement with Digital Equipment Corp. under which Object Design's object-oriented database would be built into Digital's application development framework for the DEC OSF/1 operating system. Object Design President Ken Marshall said the deal will be announced by next month.

A pact with Digital that makes ObjectStore the object database of choice for Digital Alpha customers will more than likely expand Object Design's share of the object database market, which was 29% in 1993, according to Steve McClure, an analyst at International Data Corp. (IDC) in Framingham, Mass.

Total sales for the market topped \$75.8 million last year, with rival Servio Corp. taking 12% of the pie and O2 Technology, Inc. taking 10%, according to a recent IDC report.

The strategy to coax hardware and software firms to embed the ObjectStore database into their products has helped Object

Design stay ahead of rivals such as Ontos, Inc. and Objectivity, Inc., McClure said.

In that vein, Object Design is also talking with Taligent, Inc. about incorporating ObjectStore into Taligent's object-oriented environment, which is under development, according to Bill Blundon, vice president of marketing at Object Design.

### What Taligent needs

Taligent "needs a persistent object store, just like Sun did," Blundon said, referring to Sun Microsystems, Inc.'s 1993 decision to adopt ObjectStore as the anchoring database for its Distributed Objects Everywhere development system.

However, an agreement with Taligent is not imminent, Blundon said. Taligent declined to comment.

In addition to technology pacts, Object

### Triple the revenue

IDC reported that Object Design was the fastest growing object database vendor. Its license revenue increased by almost 150% from nearly \$9 million (\$10.5 million in total revenue) in 1992 to \$22 million (\$25 million in total revenue) in 1993 — approximately three times the revenue of its closest competitors.

Design is attracting financial commitments. The company plans to announce that it has garnered \$7 million in private financing, including funding from AT&T Corp., Marshall said.

Such endorsement from hardware makers "is a major contributor" to the growth of the long-dormant object database market in general — and Object Design specifically, McClure said.

IBM bought a \$27 million chunk of Object Design a year ago. Now AT&T, which invested a small amount of equity in the company last October, has increased its stake significantly, Marshall said, but he

declined to say by how much.

IDC called the IBM investment and its purchase of ObjectStore licenses "one of the most significant events in the object database market in 1993."

## Corporate restructuring

# Platinum adds executives in wake of revenue woes

By Rosemary Cafasso

Platinum Software Corp. last week said it signed on two executives after last month's corporate tailspin, which included a series of resignations.

In addition, a company spokesman said the Securities and Exchange Commission has not yet launched an investigation into Platinum's supposed improper revenue reporting.

Platinum officials had expected an immediate investigation and said it was one reason why several executives resigned from its board last month. The SEC declined to comment.

### Executive changes

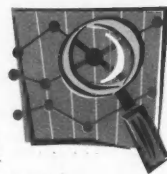
On the executive front, Carmelo Santoro, who has been acting chief executive officer, has officially stepped into that role. The company named Michael Simmons day-to-day chief financial officer, replacing Bruce Edwards, interim CFO.

Edwards, who is senior vice president and CFO at AST Research, Inc., held the temporary CFO position at Platinum for two weeks and will continue on as a

Platinum board member.

Santoro, who has worked at various high-tech companies, has been on the Platinum board for a year. He replaces Gerald Blackie, who resigned last month.

Simmons was most recently CFO at Dynasty Classics, a manufacturer of commercial and residential lighting products.



### The start of troubles

Platinum's woes began last month when it announced that revenue for the quarter ending in March would land in the \$13 million to \$15 million range, below analysts' expectations. The company also said it would likely need to restate revenue for previous quarters because of "revenue recognition problems."

The financial news was accompanied by the resignation of CEO Blackie and CFO John Erickson from the company and the board of directors. Two other executives stepped down from the board as well.

The company is expected to announce within a few weeks a restructuring plan that is likely to include layoffs.

# Solbourne cuts workers, servers

Solbourne Computer, Inc., once the most prominent of the SPARC clone vendors, last week cut 65% of its 180-person work force and discontinued the design, manufacturing and marketing of its SPARC-compatible servers. The Longmont, Colo., vendor said it will refocus on reselling Oracle Corp. financial applications running on Sun Microsystems, Inc. systems.

"Getting out of the manufacturing business allows us to consolidate our efforts in helping Oracle Financials customers save time and money," said Solbourne Chief Executive Officer Carl Herrmann. "From now on we expect to install Oracle Financials on Sun systems instead of Solbourne systems. That is the primary change."

Solbourne and Sun are currently discussing an agreement to allow Solbourne to resell Sun's servers as well, Herrmann added.

"Solbourne must become a leaner, more efficient company. Unfortunately, that means losing people who have contributed significantly to our current successes," he said.

The company will continue providing service and support to its installed base, mainly through its 1993 alliance with Grumman Systems Support Corp. in Bohemia, N.Y. Grumman provides on-site maintenance and support for the majority of Solbourne customers.

Grumman and Solbourne are also working on a deal to transfer ownership of Solbourne's service and support business to Grumman, according to Herrmann.



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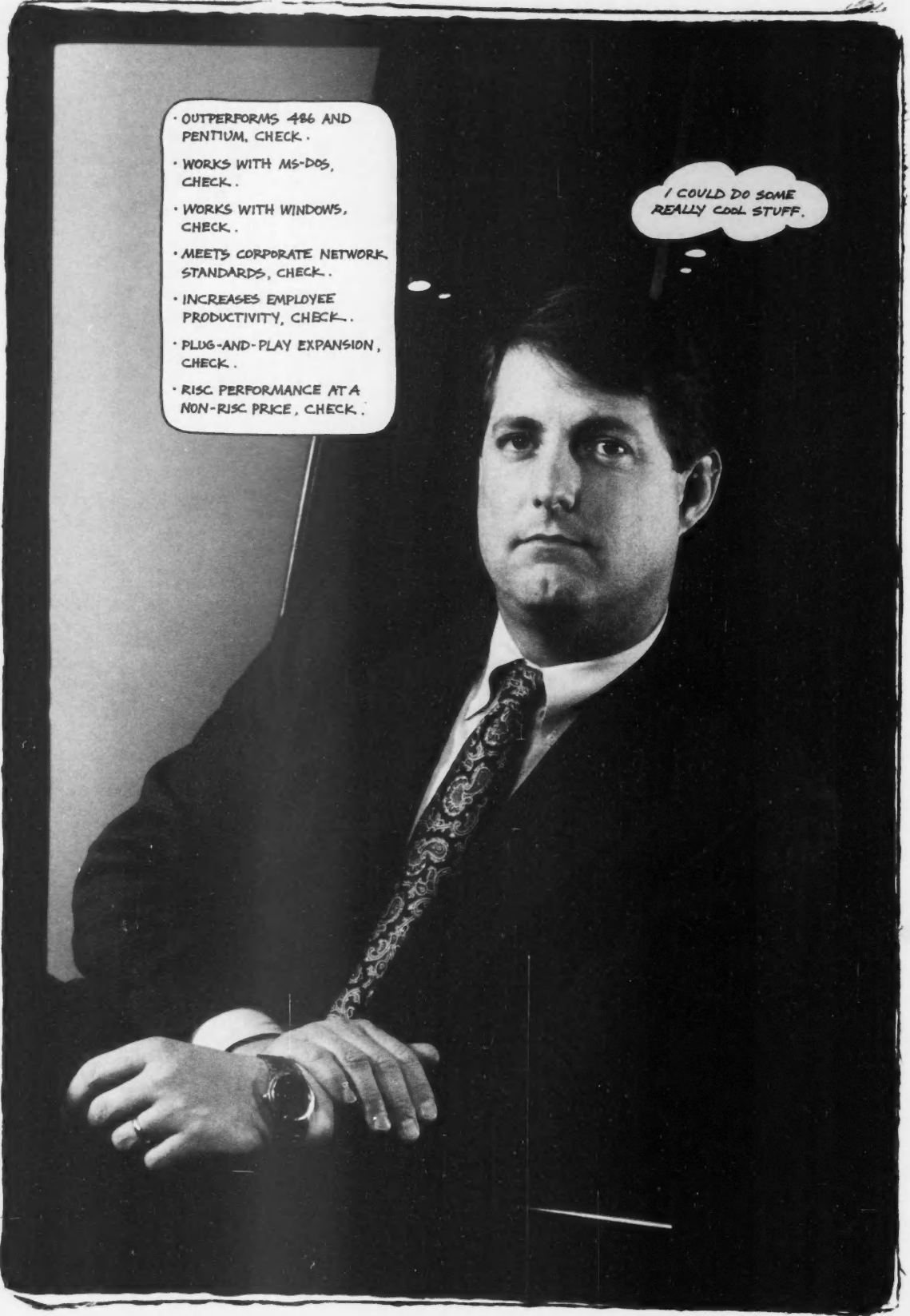
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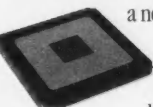
This isn't just a new family of Macintosh personal computers. It's a whole new kind of personal computer.

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The RISC technology of Power Macintosh brings a whole new level of performance to personal computing. Software written to take advantage of its unique new capabilities, in fact, will run significantly faster than the same programs written for 486 or Pentium processor-based PCs.

From left, the new Power Macintosh 8100/80, Power Macintosh 7100/66 and Power Macintosh 6100/60.

Combine the power of RISC with the practical simplicity of a Macintosh personal computer, and the result is more work done in less time, with lower support costs.

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Many Power Macintosh configurations come bundled with SoftWindows™ from Insignia Solutions, an innovation that lets Power Macintosh run hundreds of off-the-shelf MS-DOS and Windows applications at 386 and 486 performance levels. (Of course, Power Macintosh runs thousands of Macintosh productivity programs, too.)

This is just the most recent example of Apple's commitment to making it easier for MS-DOS and Windows users to take advantage of Macintosh innovations.

## The power of RISC for as little as \$1,819.\*

These days, the whole personal computer industry is buzzing about the potential of RISC processor technology in PCs.

"My next computer will be a PowerPC. I was

using Intel-based machines long before the PC was a glimmer in IBM's eye, but as Emerson said, foolishly held consistency is the hobgoblin of little minds.... It's time for

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a change, and the time is now," wrote Bill Machrone in *PC Week*. "That next machine will probably wear an Apple logo.... Apple appears to be a good six months ahead of IBM in terms of [PowerPC] product development and software integration."

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\*Effective 3/14/94. Apple Price includes the Power Macintosh 6100/60 with 8MB of memory and a 160MB hard drive. For the sake of custom configuration, keyboard, monitor and mouse are sold separately. Unless bundled with a particular configuration, SoftWindows must be purchased separately. Actual prices may vary depending on location. ©1994 Apple Computer, Inc. All rights reserved. Apple, the Apple logo, Macintosh and "The power to be your best" are registered trademarks of Apple Computer, Inc. AppleScript, Macintosh PC Exchange, Power Macintosh, QuickTime and TrueType are trademarks of Apple Computer, Inc. PowerPC is a trademark of International Business Machines Corporation, used under license herefrom. Windows is a trademark of Microsoft Corporation, and SoftWindows is a trademark of Microsoft Corporation used under license.

## Picking winners

Uh-oh. It looks like the Clinton administration is meddling in industrial policy. Call the free-enterprise police. The government is picking winners again.

But wait. Maybe this time will be different. The Pentagon's announcement last week that it will launch a five-year, \$580 million effort to encourage U.S. companies to manufacture flat-panel displays is a new approach to a government/industry partnership. It deserves a chance.

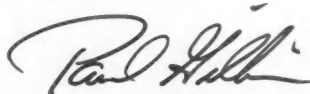
The U.S., after all, has been getting its cookies crunched in this market for some time. Flat-panel displays, such as those used in laptop computers and many other miniature electronic devices, have been aggressively pursued by Japanese high-tech firms with startling success. Japan owns an estimated 95% of the flat-panel display market.

The reason the Clinton administration — and the industry — are so worried about this technology is that flat-panel displays will be one of the most important components of computers of the future. As electronic devices continue to shrink, demand for more compact displays will surge. Active-matrix color screens are already nearing VDTs in resolution and brilliance, and only the high cost keeps them off the desktop. In the age of ubiquitous computing, conventional VDTs won't make the cut.

At this stage, however, the U.S. is poised to grab precious little of this huge market. What small presence domestic manufacturers once had was effectively killed off by the Bush administration's ham-handed effort to impose tariffs in 1991 on Japanese products that were allegedly being dumped on the market here. A loophole in that law prompted several U.S. makers to move all their portable-computer manufacturing offshore, compounding the problem the Commerce Department was attempting to solve.

In contrast, this latest initiative features some of the concepts high-tech executives asked for during the '92 campaign: research tax credits, encouragement of private-sector consortia and redeployment of defense spending to applications with commercial value. In fact, about half of the program is made up of government programs that are already pumping money into the private sector. The rest consists of R&D tax credits that industry has long sought.

Of course, the hand-wringing has already begun in Silicon Valley over the specter of the government's picking winners. But again, the Defense Department program deserves a chance. Ten years ago, the U.S. threw away its lead in memory chips to a government-backed Japanese campaign that saw products flood the domestic market at prices that were below cost. We shouldn't let that happen again. The Defense Department's proposal is an intelligent blend of public support and private initiative. Give it a break.



Paul Gillin, Editor  
Internet: pgillin@cw.com



## Re-engineering picture distorted

I was dismayed by your inaccurate story about Levi Strauss & Co.'s effort to re-engineer its North American division ["Microsoft may fit Levi Strauss re-engineering scheme," CW, April 18]. We are re-engineering Levi Strauss North America to improve the customer service requirements brought about by a changing retail environment.

To get your story, you contacted no one in the North American information resources unit where you would have received accurate information when it was available. Instead, you posed general questions in no context to people primarily outside of the re-engineering effort.

The lead paragraph states that "Levi Strauss... is taking a Microsoft NT detour" away from our Unix strategy. The facts: We are not deviating from our current strategy regarding Unix, nor is Levi Strauss North America considering Windows NT.

The story says, "Levi chief information officer Bill Eaton plans to... meet with Microsoft officials and map out technology directions." The facts: Bill Eaton visited Microsoft for a routine technical briefing. The story says, "Unix projects have been put on hold." The facts: No Unix projects have been put on hold.

The story says, "The sluggish pace of re-engineering, as much as any technology reasons, has caused second thoughts at Levi over its Unix direction." The facts: One has nothing to do with the other.

The story says, "The re-engineering... will include layoffs." The facts: The company has not reached a final decision regarding headcount; we do plan to move some employees closer to customer locations out of the Bay Area.

This story offers no real picture of our re-engineering, its impact on Levi Strauss & Co., our customers or our relationship with technology suppliers.

Rich Lack  
Vice President,  
Information Resources  
Levi Strauss North America

## High utilization: We've got it

There isn't a paragraph in Harold Lorin's "Achieving high utilization" [CW, March 21] with which I agree. I'm reminded of the aeronautical engineer who proved conclusively that bumblebees can't fly. The bumblebee, oblivious to the math, stubbornly continues to fly.

Mr. Lorin's insistence that mainframes can't be tuned for high utilization without experiencing unreliability, system crashes, user discontent and unacceptable loss of system resources to overhead is, quite simply, wrong. We run multiple loosely coupled mainframes at 100% utilization with near-100% uptime and boringly consistent response times (.25 seconds or less) with very acceptable system overhead. Such empirical success in our shop and many others very effectively invalidates Mr. Lorin's academic pontifications. The bumblebee can and does fly.

Perhaps Mr. Lorin would like to

present his opinions and studies at the next annual Computer Measurement Group conference. I'm sure the attendees would find his views stimulating.

Joseph A. Vincent  
Louisville, Ky.

## Go figure

Your In Depth: Software Roundtable ["Cool under fire," CW, April 11] featured pie charts indicating that 37% of IS projects are over budget and 56% are late. But I just read in "When JAD goes bad" [CW, April 25] that "95% of all IS projects slide into cost and time overruns."

How can I rely on you for accurate information when, in two issues separated by only two weeks, you publish completely contradictory figures?

Daniel S. Cohen  
Vienna, Va.



Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor in Chief, Computerworld, P.O. Box 9171, 375 Commonwealth Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail: 279-6273; Internet: letters@cw.com. Please include a phone number for verification.

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## Viewpoint

# Take your message to the people

Akram Yosri

**A**re you taking the information technology message to your entire IS staff? Down to the lower ranks? Before you answer that question, think again. While you may be sharing your ideas and goals with your direct reports and a couple of senior managers, this could be where it stops.

Communicating the goals, directions and challenges of the IS unit directly to its own members is seldom done, especially in large corporations. This phenomenon can be attributed largely to the same old management dilemma: the larger the management structure, the less communication among its members. Even in organizations where communication channels appear to be open, politics, preferences and hidden agendas may derail these channels and clog them over time.

The problem worsens when the IS unit operates under volatile business conditions that

create a sense of instability.

I recall the experience of one CIO who spent four months performing damage control through communication with his IS staff to curb the turmoil that followed rumors of his outsourcing endeavor. As it turned out, this CIO never intended to fully outsource the IS function; rather, he was contemplating out-

sourcing data center operations located in another state, which would not have had any impact on the core of his IS unit.

Executives who have sponsored management efforts such as re-engineering and rightsizing know best about the political capital they can either

gain or lose because of communication. I witnessed the agony of one CIO who failed to clearly define what he had meant by "re-engineering core processes." It meant something different to each of the managers who delivered what he or she thought the CIO meant to their staff. While what he meant was a lot simpler than what he said, the message created

anxiety on the part of some employees, who associated the message with an "early retirement package" rumor that had surfaced a few weeks earlier.

Later that week, this CIO used E-mail to dispel the rumor by laying out, in plain English, the goals and ramifications of his re-engineering initiative.

Better communication also creates the following:

- A sense of importance, partnership and teamwork among those who do not get to communicate directly with their CIO and his senior executives.
- An enhanced level of awareness among IS staff members of their contribution to the organization, or maybe, failures.
- A sense of empowerment for all employees.
- A forum for the CIO to convey his or her vision of new technologies and how they may impact the organization.
- An image of CIO leadership that ensures the troops will rally under one flag.

If you are a CIO, taking your message directly to your people may be the missing ingredient your IS organization has long needed.

Yosri is a consultant and lecturer at New York University's Information Technology Institute.

*The problem worsens when the IS unit is operating under volatile business conditions.*



# Senile dementia for artificial intelligentsia?

Michael Schrage

**T**hanks to an impressive array of pompously wrong predictions, America's artificial intelligentsia has a hard-earned reputation as the arrogant booboisie of bit-twiddlers. Carnegie Mellon artificial intelligence pioneer cum Nobel laureate Herb Simon still gets kidded about his confident '60s prediction that a computer would be the world's chess champion within 10 years.

I'm particularly fond of the computer science department bon mot, "If it works, it's no longer AI." But, if you're willing to strip out the jokes and take a cold, hard, dispassionate view, the simple truth is that AI has had a bigger impact on enhancing organizational productivity than any other software trend of the last decade — including GUIs, CASE and object-oriented languages.

In terms of measurable results, AI (as defined by rule-based production systems) is — dollar for dollar — probably the best software development investment that smart companies have made. Talk with any successful Wall Street investment house or financial services firm and it will (confidentially) confirm that its proprietary trading operations would stall out without its "expert systems." These systems are handling hundreds of billions of dollars worth of investments.

From logistics to customer service, rule-based expert systems are the core of organizational effectiveness at companies such as Du Pont, Campbell's Soup and Federal Ex-

press. Look at MIT Press' annual anthology *Innovative Applications of AI* and you'll be stunned at how ingenious these systems have become.

We completely miss this quiet transformation because there is no Microsoft or Oracle or Lotus of AI/expert systems to symbolize them — and there isn't going to be. AI has successfully eluded the best efforts of a lot of energetic entrepreneurs to turn it into computerdom's next big medium. AI isn't software; it's an organizing principle for software design. What is "workflow" software but the importation of rule-based methodologies to workgroup processes? What is the rise of "agents" but a new way to package rule-based expert systems?

The more sophisticated (and successful) organizations understand that "expert systems" are less about capturing the expertise that resides in individual brains and more about what it means to codify core competencies held by groups of people. Expert systems are becoming experts' systems. They reflect the importance of relationships among minds not just the symbols that are in them.

Sure, these rule-based systems are brittle. Sure, the meta-rules aren't as robust as anyone would like. But look at the medium of object-oriented, client/server architectures and it's immediately apparent that rule-based systems — flavored with statistics and fuzzy logic — are going to become the end-user computing tools of the 1990s. E-mail filters are just the beginning. To talk about re-engineering without crafting rule-based end-user systems will

make about as much sense as accounting without spreadsheets.

In other words, rules rule. The Academic AI Paradigm (sorry!) may have cost venture investors hundreds of millions of dollars in the 1980s, but it has become the most cost-effective design theme for corporate

America this decade. The artificial intelligentsia may be pompous and arrogant, but from this angle, it looks like they've won. Now I've got to go off and train my new neural net.

Schrage is a fellow at the MIT Sloan School Center for Coordination Science. His Internet address is [schrage@media-lab.media.mit.edu](mailto:schrage@media-lab.media.mit.edu).



*In terms of measurable results, AI is — dollar for dollar — probably the best software development investment that smart companies have made.*





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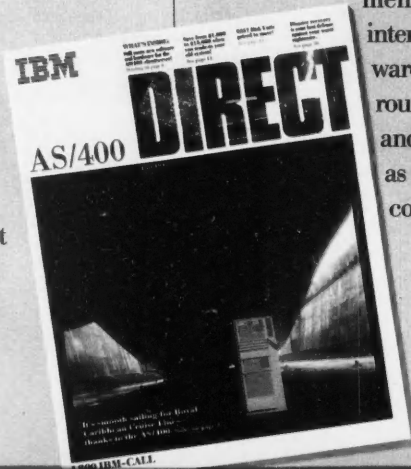
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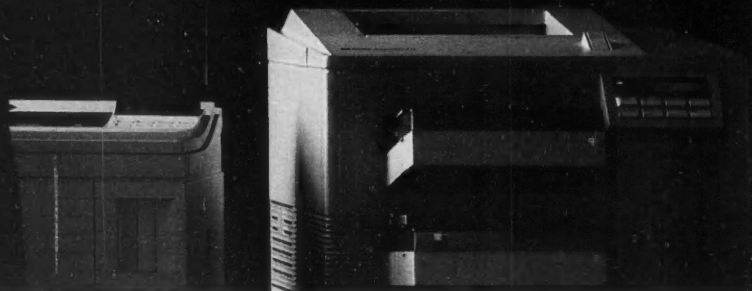
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# Desktop Computing

MICROSOFT AND INTEL TRY TO  
STAY ABOVE THE FRAY, 44  
NEW PRODUCTS, 49

## Operating systems

### IBM ramps up PC DOS system

By Ed Scannell

■ IBM's Personal Software Products division has delivered a follow-on to its PC DOS 6.1 operating system that incrementally improves the product's memory management, built-in utilities and support for a broader range of PCs.

PC DOS 6.3 has been enhanced to let users better track and optimize multiple application configurations. Users can create several different configurations of their AUTOEXEC.BAT and CONFIG.SYS files and then choose among them at start-up to make better use of hardware resources.

Version 6.3's RAM-boost, the memory optimizer IBM licensed from Central Point Software, Inc., has also been enhanced to support multiple configuration environments. It is able to store and execute separate memory management schemes for each configuration.

IBM has also improved its internally developed antivirus utility. The tool can now scan, identify and eliminate a total of 2,000 viruses, or 40% more than its predecessor.

"There aren't any spectacular improvements, but they have made the sorts of changes they needed to make. I still think IBM is more attuned to what DOS users want than Microsoft," said Jim Forney, a beta user and consultant in Brick, N.J.

#### Compression advantage

One advantage PC DOS 6.3 continues to have over MS-DOS 6.21 from archival Microsoft Corp. is its built-in disk compression, which nearly doubles the size of users' hard drives.

Microsoft was forced to remove its DoubleSpace compression utility earlier this year because it infringed on two patents owned by Stac Electronics. Microsoft is expected to replace it with a compression product of its own design sometime next month.

While PC DOS 6.3 will continue to have the SuperStor/DS compression utility contained in Version 6.1, Personal Software Products intends to supply a version of Stac Electronics' Stacker in a future PC DOS release. Last month, Personal Software Products signed a licensing deal with Stac to use its compression technology in future versions of both PC DOS and OS/2.

The good news is that with Version 6.3, IBM has covered Microsoft's move with MS-DOS 6.21. The bad news is the delivery of Workplace Shell for DOS has been delayed from the second quarter to the fourth quarter.

With OEMs shipping increasingly larger hard drives with their systems, built-in data compression does not appear to be as much of a competitive advantage as it was a year or two

DOS, page 44

## OS/2 desktop hopes dim

IBM may be a day late and a dollar short with new 32-bit applications

By William Brandel  
and Ed Scannell

Five years and \$5 billion later, corporate users will finally get their chance to buy and use a suite of 32-bit applications designed for their OS/2 desktops. Its arrival, however, appears to be too little, too late for information systems users, many of whom have decided that OS/2's place is not on the desktop.

At its recent developer's conference, IBM again tried to rally the OS/2 development community for desktop applications and convince them that there is a meaningful life for OS/2 on the desktop. Lotus Development Corp. recently gave users some reason to believe that claim by unveiling an improved version of SmartSuite for OS/2.

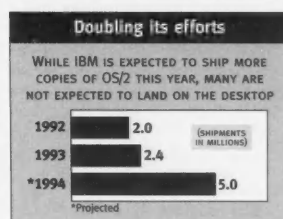
Despite this, users—even those who have been loyal to the OS/2 operating system—are not expected to be wooed by even these new 32-bit offerings from major vendors such as Lotus.

"It really will have no impact on us," said Sheldon Laube, national director of information and technology at Price Waterhouse. Laube said Price Waterhouse, which is filled with pockets of OS/2 as well as Notes, buys its desktop

applications from a Lotus competitor in the Windows environment.

#### Windows has won

Laube, like many IS managers, underscores the OS/2 dilemma: He has invested in the operating system, and it works well in certain capacities, such as on the server or for mission-critical



Source: International Data Corp., Framingham, Mass.

application development. But the battle for application control on the desktop is virtually over. Users want Windows applications, not those written natively for OS/2.

For example, Standard Register in Dayton, Ohio, is now downsizing its line of business applications off the mainframe to a client/server setup.

The company is not excluding OS/2 from its strategy, but its role on the desktop will be very limited, said Mike Swabb, lead programmer/analyst at the company.

Swabb, like many users, said the main reason OS/2 has not had a greater impact at his company is that it delivered too little, too late in the way of applications that fully exploited its best features, including true 32-bit, preemptive multitasking and the Workplace Shell graphical interface. In the meantime, Windows applications have become an established standard on Standard Register desktops.

#### Losing ground

Nor is OS/2 application development controlling new ground in the independent software vendor community. In recent months, major vendors such as WordPerfect Corp. and Corel Corp. have either backed off or wavered in their development commitments to OS/2. Borland International, Inc. has no plans to move its desktop databases over to the operating system, and Microsoft has pulled the plug on its OS/2 LAN Manager.

OS/2, page 45

## Relational database market gets boost

Bundling deals help lower prices

By William Brandel

For years, database vendors and users have debated the merits of flat-file technology vs. relational technology. In the PC database arena, it appears that the argument is being settled by price.

Relational PC databases have established a market presence in the last two years, and as a result, information systems departments are snatching them up.

"Now, relational PC databases are as easy to use as a flat-file one," said Robert Griffin, vice president of IS at Bank of New York. Because of this, "in my view, flat-file [databases] would go away," he said.

Market data bears out this point of view. International Data Corp. (IDC) in Framingham, Mass., reports that 87% of worldwide databases shipped on DOS, OS/2, Windows and Macintosh platforms in 1993 were relational vs. only 13% for flat file.

IDC's market projections also indicate that almost all PC database sales will be relational through 1998, with the Windows sector enjoying an 11% growth rate.

All the major PC software vendors except Novell, Inc. develop and sell a personal relational PC database product. Borland International, Inc. offers Paradox and dBase, Microsoft Corp. sells FoxPro and Access and Lotus Develop-

ment Corp. offers Approach.

A number of factors have conspired to drastically lower the price of these relational products in an increasingly crowded PC database market. One factor has been personal productivity application suites.

#### Competitive pricing

**Alpha Software Corp.'s Alpha 3.0:** \$369; upgrade \$109.  
**Borland International, Inc.'s dBase:** \$84; upgrade \$95.  
**Borland's Paradox 4.5:** \$502; upgrade is \$137 for DOS users, \$138 for Windows users.  
**Microsoft Corp.'s FoxPro for Windows 2.5:** \$306.  
**Microsoft's Access 2.0:** \$495; upgrade \$123.

#### At a fraction the cost

By bundling databases with their other products, users pay only a fraction of the price they would pay in a stand-alone configuration.

"It's not just because of suites," said Nicole Roth, an analyst at IDC. Roth said vendors are bringing down user costs with introductory pricing and competitive upgrades.

For example, Microsoft just began delivering its Access 2.0 for Windows, a relational PC database product, last month. With a list price of \$495, Access can be bought for \$99 through June. The upgrade price is \$123.

The competitive pricing in the database market was triggered back in late 1992, when Borland offered its Paradox for Windows product, which now sells for \$138.

This precedent has resulted in Windows-based PC databases often selling for less than their DOS counterparts.

Introductory prices also linger for months after a vendor's introductory offer expires, Roth said. Dealers often stock up on a product at the introductory level, then offer their own introductory price until that stock runs out, she said.

Michael Fitzgerald

## Success at what cost?



IBM got big and influential by making life easier for users. Microsoft and Intel have superseded IBM's influence by doing the same thing.

Microsoft's operating systems and Intel's chips have given

the industry the equivalent of the two-pronged electric outlet plug—everything from lights to lava lamps can be built around the base these two companies now provide. This is good for users, who can pick and choose from a wide variety of software and hardware and not worry about whether it will run.

But these two companies may have seen their apex in the market.

In no way do I suggest that Intel and Microsoft will go the way of all things anytime soon—far from it. But their domi-

nance, too, shall surely pass, and we may be seeing signs of that right now.

"What's that?" you ask. "Intel and Microsoft waning? Their sales and profits seem to break records every quarter. How could they be waning?"

It may seem, in fact, that their power is spreading as computers infiltrate the home, and particularly as their root PC technology becomes powerful enough to run entire companies.

Intel chips now can be harnessed into a massive system configuration with the power of a supercomputer, and this sort of parallel microprocessor-driven architecture is clearly the future. Even IBM's future mainframe direction centers on multiple microprocessors, although Big Blue will use the PowerPC. Microsoft's Windows NT looks something like VMS brought to the desktop from the VAX.

### Issues for Microsoft

But Microsoft may be getting sloppy. The company created a noncompete clause that some rivals had to sign to participate in the beta program for Chicago, the next version of Windows [CW, April 25]. Microsoft rescinded this policy, apparently because the Department of Justice got a whiff of it.

How could a company, whose industry dominance has given the Justice Department reason to sniff around, tell its major competitors not to write software that

competes with its standards efforts? The sheer hubris suggests that Microsoft may be letting success go to its head.

While Microsoft worries about whether it will have to defend itself against charges of misusing its operating system monopoly, its counterpart, Intel, has no such worries. Intel has so many competitors it needs a program to tell them apart.

### Intel's position

Intel's market posturing says it will beat the transistors out of the competition through its huge manufacturing capacity and capital investments. It will produce faster Pentium chips and bully the market to accelerate its move to Pentium systems, both to fend off clone-makers and obviate the need for its customers, the PC makers, to even think about buying a PowerPC.

But Intel may find that having all its customers hate it is a bit much to manage. PowerPC may be the least of its worries, compared with mutiny in the ranks.

Let's look at 1994 from an off-perspective here. Here are three dates that future business historians may cite as the undoing of Intel:

● April 11: IBM, Intel's largest customer, decides it will both build and sell Cyrix microprocessors. Basically, IBM can build as many of these Intel clones to use as it likes. Can we read between the lines here?

● Jan. 26: Compaq, poised to become Intel's largest customer, says it will use chips from Advanced Micro Devices, Intel's archrival. The primary reasons cited: It needs lower-priced chips to com-

pete in the bitter European consumer market and wants a second source of supply.

● Jan. 10: Zenith Data Systems introduces the Z-Stor, a PC server family that uses neither Intel chips nor a Microsoft operating system, the first time this has happened in years.

### Changing times?

None of these will hit Intel in the wallet anytime soon, but they may represent the turning of a season.

"Intel is not about to fall, but... these little losses represent a shift in their position in the market," says Richard Zwetckhenbaum, an analyst at International Data Corp.

Zwetckhenbaum isn't a fool. He knows Intel's market share will not drop solely from these episodes; nor

do these events mean any of these companies are leaving Intel behind. But these blips may indicate that Intel's dominance will erode over time.

Do these tiny fissures in the Microsoft/Intel wall of influence mean big things for users? There could be some pricing actions, particularly in the hardware realm. But if there's going to be a major shift in the industry's standards, it won't be seen until later this decade at the earliest.

In the long term, it probably means we'll all be learning new tricks as the computer industry is reborn with or without Microsoft and Intel.

Fitzgerald is *Computerworld's* senior editor, mobile computing.

Microsoft's and Intel's dominance, too, shall surely pass, and we may be seeing signs of that right now.

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## DOS

CONTINUED FROM PAGE 43

ago. Most corporate accounts now use it mostly for laptops.

Available through IBM's usual reseller network, PC DOS 6.3 costs \$77 for users of DOS 2.1 through MS-DOS 6.0 or \$24 for PC DOS 6.1 users.

### Theos adds to DOS

Separately, Walnut, Calif.-based Theos Software, Inc. has released a multiuser version of DOS that can be set up as either a stand-alone multiuser DOS workgroup or a network companion.

Called Theo+DOS 32, the product lets both PCs and PC terminals share a 32-bit host system and peripherals through a simple RS-232C phone cable connection. Users are not required to add any other software or network cards.

A workgroup using Theo+DOS 32 can coexist and communicate with other parts of a company's enterprise over networks. For example, a user can send data to a user on the other side of an enterprise through a Novell, Inc. or 3Com Corp. connection.

Available now, Theo+DOS 32 costs \$199 for a single-user connection and \$599 for a five-user connection.

## Briefs

### HP beefs up server line

Hewlett-Packard Co. is beefing up its server offerings with the introduction of a new line of low-cost, entry-level systems based on Intel Corp. architecture. The new HP NetServer LC Series, which will enter the market with price tags starting at \$2,629, supports six Peripheral Component Interconnect and Extended Industry Standard Architecture (EISA) expansion slots, an optional external EISA disk array and Fast SCSI capabilities.

### PC Co. bundles support

The IBM PC Co. has started to offer remote diagnostics and other on-line support capabilities to customers of its latest PS/1 offerings. The PC Co. will bundle its new On-line Housecall as a standard feature on four new PS/1 systems being launched today. The systems, which are based on Intel 486 processors, have increased hard drive storage capacities, ranging from 170M to 720M bytes.

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- (b) Netware (f) Windows NT
- (c) OS/2 (g) Windows
- (d) Unix (h) NextStep

- App. Development Products ☐ Yes ☐ No
- Networking Products ☐ Yes ☐ No

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### Operating Systems

- (a) Solaris (e) Mac OS
- (b) Netware (f) Windows NT
- (c) OS/2 (g) Windows
- (d) Unix (h) NextStep

- App. Development Products ☐ Yes ☐ No
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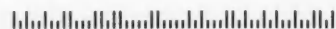
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## OS/2 desktop hopes dim

CONTINUED FROM PAGE 43

OS/2's last hope for a presence on the desktop hinges on users' moving to a 32-bit model. IBM's and Lotus' hopes have been buoyed by Microsoft Corp. Windows NT's failure to make an impact on users' desktops.

A survey of 400 IS managers conducted in February by Framingham, Mass.-based International Data Corp. (IDC), indicated that users' opinions of OS/2 improved after NT's delivery last August. Of the 400 IS managers surveyed, 144 said their opinion of OS/2 changed after NT shipped. Among those, 81% said they had a more positive opinion of OS/2. More than 64% said they had a more negative attitude toward NT.

However, the survey confirms how difficult it will be for IBM or Lotus to make an entree at the 32-bit level: Only 22% said they saw any reason to replace their 16-bit Windows applications with 32-bit Chicago programs.

### No need for 32-bit

"We don't need 32-bit applications on the desktop at this point," said Michael Joslin, MIS director at Diamond Packaging in Rochester, N.Y.

Joslin did say Diamond was considering Microsoft's upcoming Windows 4.0, code-named Chicago. "We're looking at it for the integration of Windows into the operating system. We don't care whether it runs 32-bit or not."

Market figures cite OS/2's failure to make any dent in the momentum of Windows applications. The application-to-operating-system shipment ratio for OS/2 stands at 1-to-22, according to IDC. Meanwhile, the Windows-applica-

tions-to-Windows ratio stands at nearly 1-to-1.

### Chance for success?

Further reinforcement of Windows' strength are estimates that indicate OS/2's strongest growth as an operating system is in its OS/2 for Windows operating system. Since its November introduc-

tion, sales figures for OS/2 for Windows have topped the 500,000 mark in the U.S. alone. Many of those sales, however, have gone through retailers to small and medium-size accounts.

IBM and Lotus officials, naturally, believe the operating system has a chance to succeed on the desktop. They cite internal figures that the operating system has grown from about 1 million units at the end of 1992 to 4.5 million units by the end of last year.

Bolstering that optimism was IDC's recent readjustment of its sales projections for OS/2 in 1994. The market researcher now predicts IBM will sell another 5 million copies of OS/2 this year, raising its installed base to almost 10 million by year's end.

But IBM and Lotus officials would not dispute market figures showing sales of desktop productivity applications for OS/2 falling to fewer than 250,000 units in 1993.



## Lotus to offer Chicago alternative

Lotus continues to build on its large OS/2 development effort as it moves to its next-generation, 32-bit application strategy.

Noting that most developers at Lotus know OS/2 first and Windows technology second, Lotus is building a new application engine model based on 32-bit OS/2 code.

Application components such as Lotus' 1-2-3 or Ami Pro would work as a plug-and-play option on the application engine. The new generation of applications are expected to be ready in the Chicago time frame, Lotus officials said.

"We plan to sell our OS/2 applications to those users who want a 32-bit application but who will get tired of waiting for Microsoft's Chicago," said Hilmi Ozguc, OS/2 product line manager at Lotus.

—Ed Scannell and William Brandel

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## Desktop Computing

**Conner Peripherals, Inc.** has introduced the Filepro Advantage product line, a series of 3½-in. hard drives that offer formatted capacities of 425M, 850M and 1.275G bytes.

According to the San Jose, Calif., company, features for the products include support for PIO Mode 4, the integrated drive electronics specification for transferring data at a rate of 16.7M byte/sec.; a proprietary "tag queue" for SCSI-2 drives that optimizes the execution of certain disk operations; "power save" commands that can put the drives in "stand by" or "sleep mode" automatically; and adaptive segmented buffers.

Prices range from \$255 to \$599.

► **Conner Peripherals**  
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**Alaris, Inc.** has introduced Leopard Plus, a PC-compatible motherboard based on IBM's 486 SLC/66 microprocessor.

According to the Fremont, Calif., company, features for the product include a full 32-bit motherboard architecture; upgradable flash BIOS; large expandable cache (128K bytes standard, 512K bytes maximum); optimized support for Alaris EnergySmart software; a 387SX math coprocessor; and a Pentium technology upgrade socket.

Alaris' Leopard Plus costs \$399.

► **Alaris**  
(510) 770-5700

**Corex Technologies, Inc.** has introduced CardScan, a Windows-based software program that reads, understands, extracts and files information from business cards.

According to the Brookline, Mass., company, CardScan automatically recognizes names, titles, companies, addresses, phone numbers, fax numbers and electronic-mail addresses and stores the information in a built-in address book database.

CardScan features include one-button operation, a Rolodex-like interface, extensive import and export capability, data display by name or company and the ability to handle thousands of business cards.

CardScan costs \$395.

► **Corex Technologies**  
(617) 277-5344

**Individual Software, Inc.** has introduced Professor Office for Macintosh, an

interactive, computer-based training product.

According to the Pleasanton, Calif., company, the product provides instruction to users who want to increase their productivity in Microsoft Corp.'s Word 5.1 and Excel 4. Professor Office covers topics such as preferences, work menus, split windows and advanced outlining.

The program offers eight to 10 hours of training content, covering basic and more advanced features. It features a

menu-driven format that lets users run the lessons in any order.

The product costs \$49.95.

► **Individual Software**  
(510) 734-6767

**Micrografx, Inc.** has announced ABC Toolkit, software that provides the tools to document, analyze, measure and improve performance.

According to the Richardson, Texas, company, ABC Toolkit is a Windows pro-

gram with three components for change management. The ABC ProcessAnalyzer produces process flow charts; the ABC DataAnalyzer creates statistical charts; and *Eating the Chocolate Elephant*, a book by Micrografx vice president Mark Youngblood, outlines the steps for implementing a process improvement initiative.

ABC Toolkit costs \$895.

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# RemoteWare,

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A skeptic  
FROM WAY BACK,

Jared Farrell the  
Salesman had out-  
lived more than

one attempt at automating field communications.

The near-daily software updates. Nightly communication sessions that didn't. Inventory that wasn't.

Prospects that...weren't.

So the fact that something called RemoteWare® had been implemented to automate sales processes for farflung laptop jockeys like himself had held little charm for Farrell. A client/server system built with software tools already happily in use in hundreds of large companies world-

wide, with automated dial-up communications for transporting centrally-created electronic forms, documents and reports between home office legacy systems and even the most remote PCs? Terrific. Plus routing and query facilities to make sales-critical information simple to get and easy to use...on the road. Excuse me?



But within just days of the fading hook shot that sent the CIO's announcement memo into Farrell's round file, he was using the new applications electronically dispensed by RemoteWare. Entering daily orders, filing expenses, and penning a humble note of thanks to the CIO, from 30,000 feet. All quietly and automatically delivered by RemoteWare while he slept. A fitting complement to the inimitable selling routine of one Jared Farrell. Indeed.

Now, as he slid into the Central Office Staff Room six months later and five minutes late, Farrell watched the eyes of the room swivel towards him, like half a volley at Wimbledon. And the CIO and VP

of Sales were headed his way with...a plaque? "Jared Farrell, Salesperson of the Year," it read. Salesperson of the Year. Imagine that.

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## Dell serves up new strategy, products

By Jaikumar Vijayan

■ Hoping to further demonstrate of its recent focus on servers, Dell Computer Corp. last week showed off a dual-processor, symmetrical multiprocessing (SMP) server running Microsoft Corp.'s Windows NT.

The server, which is fully compliant with Intel Corp.'s multiprocessing specification (MPS 1.1), is an upgraded version of Dell's PowerEdge 590/SP platform. It features two Intel Pentium 90-MHz chips and supports Extended Industry Standard Architecture and Peripheral Component Interconnect local bus architectures, fast SCSI and onboard networking. It was demonstrated at Network/Interop '94 in Las Vegas.

Analysts reacted positively to Dell's emphasis on servers but were cautious about estimating its success.

"Dell clearly needs to change their product mix, but right now they are standing in line behind everybody else" as far as the server market is concerned, said Randal Giusto, an analyst at BIS Strategic Decisions in Norwell, Mass. Dell has its work cut out for it leveraging its distribution channels and support infrastructure to make its strategy work, he said.

### Pushing upgrades

By putting a two-processor, scalable motherboard on its uniprocessor platform, Dell said it hopes to demonstrate not just the upgradability of its current server lines but also the low cost of upgrading. "We are going to call into question the price that customers are paying for scalability," said Martin Seyer, manager of advanced systems product marketing at Dell.

Dell will not commit to a production schedule or the availability of the systems, though some sources said the SMP servers could be available by the fourth quarter.

Dell's SMP technology demonstration is part of the company's overall strategy shift first detailed in January [CW, Jan. 17] and designed to broaden the Austin, Texas, vendor's product mix with more servers and notebooks. Last

Dell, page 56

## Users win in server wars

By Jaikumar Vijayan

As the low-end PC server market comes alive with a raft of product offerings, users can expect to see greater availability, lower systems costs and standardization across product lines.

Since early March, most of the major desktop vendors have been flooding the market with relatively low-cost desktop servers based on Intel Corp.'s latest 486 and Pentium processors.

A recent report by International Data Corp. (IDC) in Framingham, Mass., predicts that the flurry of announcements will affect the PC segment as small businesses and workgroups in larger companies expand their LAN investments.

### Result: Better products

LAN server announcements from companies such as Hewlett-Packard Co., Compaq Computer Corp., Dell Computer Corp., Digital Equipment Corp. and IBM, among others, would result in better scalability, capacity and systems management software, according to the report.

"The standardization of PC server technology across more vendors and the sheer volume of product will attract applications developers and support channels," said Lynn Berg, an analyst at Gartner Group, Inc. in Stamford, Conn.

She said low-end PC servers would find increasing use in groupware-oriented applications,

including file and resource sharing, file backup and security and database applications.

Users agreed that applications in the LAN server environment are growing. Northwestern Mutual Life Insurance Co. in Milwaukee, for instance, uses LAN servers for all its file and print applications.

Most of its database applications are handled on a Sybase/HP

ers can expect falling prices.

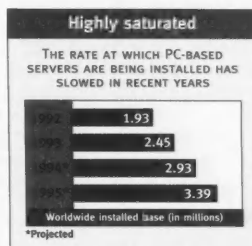
According to the IDC report, Compaq and Acer America Corp., with entry-level server offerings that start at less than \$2,500, are aggressively positioned to capture what has until now been the "PC desktop server" market. LAN server prices quoted in the report range from less than \$2,000 to just under \$20,000.

For example, an Acer Altos 800, based on the 66-MHz DX2 with 4M bytes of RAM and eight I/O slots, retails at \$1,987. A four-processor ALR Revolution system based on the Pentium 100-MHz chip, with 1G-byte SCSI and 10 expansion slots, costs \$19,382.

The flattening of margins in the traditional PC clone arena and the increased availability of off-the-shelf server software and hardware components have also made it easier for vendors to enter the server arena, said Randal Giusto, an analyst at BIS Strategic Decisions in Norwell, Mass.

As vendors begin to ride the PC server wave, they will also need to focus on related service and support issues as well as channel strategies, Giusto said.

Despite the activity in the LAN server segment, the IDC report states that systems management features are still absent from most server offerings. With the exception of HP's NetServer Assistant server management software, most vendors still do not have adequate systems management software, the report said.



Unix platform, but that could change.

"We have fairly robust applications running on our LAN servers even now," said Hugh Hoffman, Northwestern's director of information services. But as LAN servers become more robust, he said he expects to see them being used for more sophisticated applications and as limited database servers.

Meanwhile, as the low end of the server market gets increasingly crowded, analysts predict intense price pressures. With vendors trying to find ways to up the ante, us-

### Utilities

## Central backup for NT LANs debuts

By Mary Brandel

What started as a solution to a backup problem at Microsoft Corp. is now being offered as a centralized backup system for users in distributed Windows NT environments.

That is the story behind Arcada Software, Inc.'s Storage Exec for Windows NT, the initial offering in Arcada's storage management strategy laid out two weeks ago. Arcada is a spin-off of Conner Peripherals, Inc., a leading storage provider.

The product enables users to configure, schedule, monitor and control local and remote data storage from a centrally located, Intel Corp.-based server. Backup is distributed, but control is centralized.

Long term, the company is promising to manage all

storage in the enterprise, said Fara Yale, an analyst at Dataquest, Inc. But Storage Exec is currently confined to Windows NT, OS/2 LAN Manager, DOS and Windows environments. Arcada says it will support Novell, Inc. NetWare with a future release. It will also offer the product on more hardware platforms by the fall.

What sets the product apart, Yale said, is the fact that it was developed to solve a real-life problem at Microsoft, which needed a backup solution for its 1,200 servers on a Windows NT LAN. Arcada had also worked with Microsoft to develop the backup utility in Windows NT.

### Load-balancing allure

The system's ability to do load balancing is of particular interest to Bob Cadd, manager of systems and tools development at Microsoft. "If a tape fails, it will reassign that load to another tape drive that's available."

As far as Microsoft's future development plans with Arcada, "They're first on the market to meet our needs, and I don't see anything on the horizon. Their vision of enterprise-wide backups matches our own pretty well," Cadd said.

Analysts criticized Arcada's lack of cross-platform support and its support for single tape devices rather

than autoloaders. Without an autoloader, an operator still has to change tapes manually. According to Arcada, autoloader controllers will be released in the summer.

A beta user at a large food manufacturer in Minneapolis said he would like to see a number of enhancements to the product, including an archival feature, the ability to start a backup job remotely via electronic mail and better ease of use. "I would like them to make it so any operator can just stick a tape in," he said.

The beta user also said Storage Exec backs up 10M bytes of data per minute across his network; Arcada claims 25M bytes per minute without a network.

Storage Exec for Windows NT is priced at \$2,385 for a three-tape device license.

Like its competitors in the tape backup arena, such as Cheyenne Software, Inc., Arcada is positioning itself as a provider of enterprise storage, analysts said. Arcada currently offers Backup Exec, which does tape backup in Windows, NT and NetWare environments.

Arcada said it plans to partner with network management companies such as IBM with NetView and Hewlett-Packard Co. with OpenView to report storage information into those systems. It also plans to plug into Microsoft's Hermes system management product.

## Reporter's

## Notebook

Sometimes, the job of figuring out what your business competitors are doing can be as exciting as a Sam Spade novel. One practitioner in the field of "business intelligence" recalled getting on the mailing list for a rival's environmental im-

pact statement for a new facility. He figured out such details as the number of employees who would work there based on the size of the parking lot. About 600 practitioners attended the **Society of Competitive Intelligence Professionals'** (SCIP) Ninth Annual International Conference in Boston last month to swap stories like that.

Business intelligence groups are in charge of gathering, analyzing and disseminating information about competi-

tors, regulations and other factors affecting corporate success. The goal is to get vital information into the hands of key decision-makers in time to take action. The electronic systems that support this function often include customized news feeds, text-retrieval software, on-line information services, repositories for all of the accumulated tidbits and LANs to distribute the resulting reports and electronic newsletters.

However, SCIP attendees—with titles like "director of market intelligence services" and "manager of competitive analysis"—also have more mundane worries, such as how to keep their tiny intelligence units alive. At a time when corporate staff budgets are shrinking, some intelligence units have been terminated as expendable luxuries, and the remaining ones find themselves under pressure to prove their value to the company.

Several consultants said the keys to survival are a string of success stories, internal salesmanship and a laser-sharp focus on the information needed by business managers. The support of top management is also crucial, but intelligence managers often complain that it is difficult to get the attention of top management—so the keynote speech by NutraSweet Co. chairman Robert E. Flynn was a welcome treat.

Flynn, NutraSweet's straight-talking chairman and chief executive officer, said he is convinced that his company's intelligence unit is a competitive necessity, not a luxury. He estimated that it has been "worth \$50 million a year in revenue gained and revenue not lost."

Lotus Development Corp.'s Notes groupware product has become a "very hot" platform for distributing business intelligence reports and customized news feeds, according to exhibitors at the SCIP conference.

Information service vendors that support Notes distribution include the following: **Desktop Data, Inc.** in Waltham, Mass.; **Market Analysis & Information Database, Inc.** in New York; and **Individual, Inc.**, **OneSource Information Services, Inc.** and **SandPoint Corp.** all in Cambridge, Mass.

One of the veteran software vendors in the business intelligence field, **Quest Management Systems** in Chicago, will release a Windows-based version of its flagship software on June 1. Wincite, like DOS-based Incite, acts as a LAN-based repository for facts, figures and reports, while providing a structured methodology for organizing and analyzing information about competitors. The reports can be distributed by electronic mail or Notes. The price will be \$5,000 for the core module, \$10,000 for all modules and turnkey installation, and \$50,000 for an enterprise license and extensive consulting services. Quest is a unit of Shepro Braun, Inc.

—Mitch Betts

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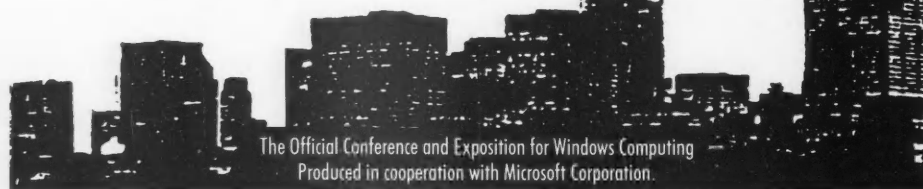
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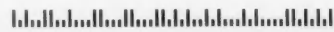


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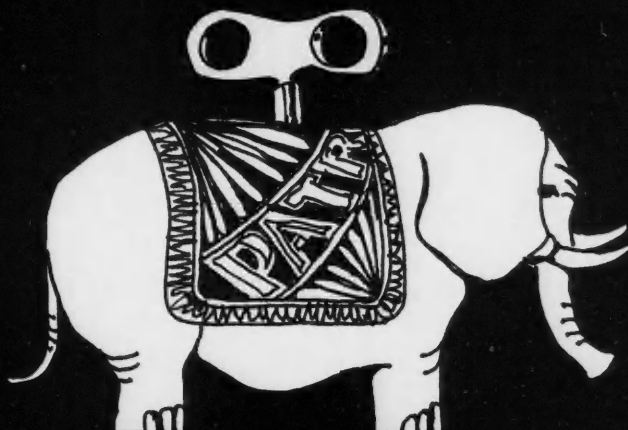


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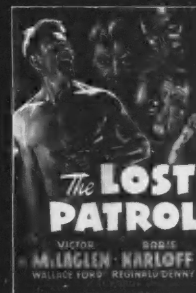
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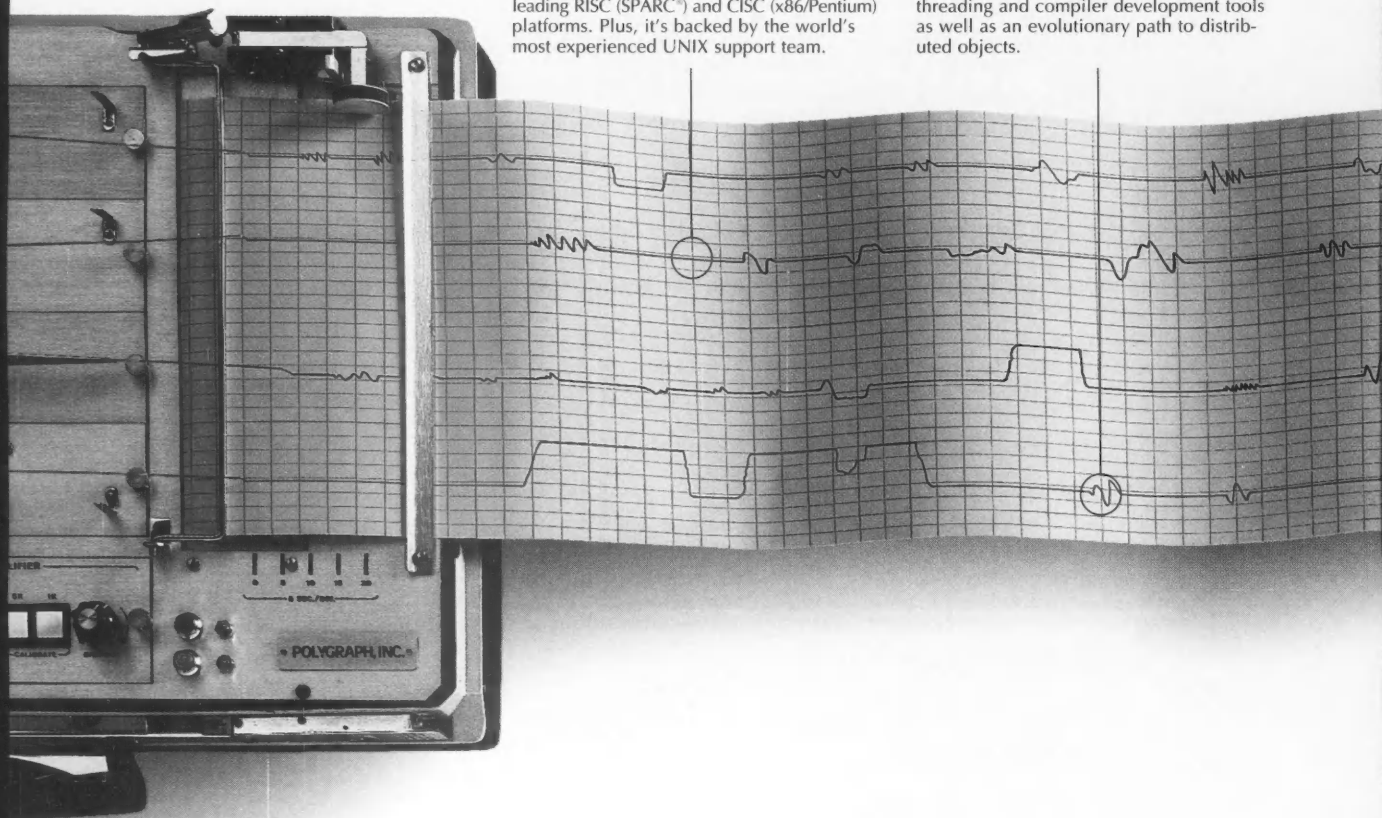
True. Solaris® has more licensed users (1,500,000+), runs more 32-bit applications (8,600+), and is installed on more multiprocessors than any other UNIX® environment. In fact, Solaris has about 50% of the UNIX software development market and is the only software environment that runs on the leading RISC (SPARC™) and CISC (x86/Pentium) platforms. Plus, it's backed by the world's most experienced UNIX support team.

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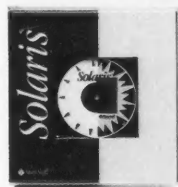
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**Jems Data Unlimited, Inc.** has introduced the Marquis Series of storage subsystems.

According to the Andover, Mass., company, the Marquis Series of disk subsystems provides up to 63G bytes of storage on a single SCSI ID and up to 441G bytes on a single SCSI controller.

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Marquis Series pricing ranges from \$11,495 to \$104,695.

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**Astea International, Inc.** has introduced PowerHelp, help desk software.

According to the Chalfont, Pa., company, PowerHelp gives users the ability to customize their software.

Support specialists can capture, analyze, route and resolve customer calls. PowerHelp features advanced knowledge-based capabilities such as case-based reasoning, bug tracking, question scripts, technical notes and rules-based tools, including decision trees, the company said.

Pricing starts at \$10,000 for a five-seat system.

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**Recognition International, Inc.** has introduced FloWare Desk Version 1.0, a ready-to-use software application for automating business processes in a LAN environment.

According to the Dallas company, users can automate administrative processes typically implemented on the desktop, such as purchasing, personnel management and budgeting, then organize and route the information as part of their overall workflow-based information system.

FloWare Desk is compatible with Windows-based packages and custom applications without additional programming, allowing users to workflow-enable their preferred desktop software tools.

FloWare Desk Version 1.0 costs \$495 per concurrent user.

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**Wyse Technologies, Inc.** has introduced the Series 6000i Model 665, an Intel Corp. Pentium-based uniprocessor system.

According to the San Jose, Calif., company, the product can support up to 128 users in a Santa Cruz Operation Unix environment. It is based on the Pentium microprocessor, with clock speeds of 60 MHz or 66 MHz.

The Series 6000i Model 665 connects the 64-bit microprocessor through 64-bit data paths to 256K bytes of Level 2 cache and up to 192M bytes of system memory.

The product features an Extended Industry Standard Architecture expansion bus with seven slots and a user-selectable speed ranging from standard 7.5 MHz to 11 MHz.

An entry-level system costs \$9,000.  
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## Paper, film far from extinct

By Ellis Booker

Despite the hype, the transition to digital will not happen overnight, according to executives at Xerox Corp. and Eastman Kodak Co. In separate events, executives from the venerable companies — which built their businesses around printing and film technologies, respectively — made clear their intentions to participate in the "information highway" but not abandon their historic markets.

"Most forecasts say the market for paper will continue to grow moderately," said Peter Van Cuylenburg, vice president of operations at Xerox. "By making paper better, we may even enhance this growth."

At the Association for Information and Image Management show held recently in New York, Xerox outlined plans to open the architecture of its hardware platforms to provide "publish-on-demand" services, including the ability to transmit customized documents across wide-area networks to high-volume printers.

In a lavish and long press conference, the copier giant announced that some 50 companies — including AT&T, Adobe Systems, Inc., Novell, Inc. and Sun Microsystems Computer Corp. — had joined it in a "New Document Alliance." The partners will develop to a Xerox software platform called DocuSP, an open framework for linking printers, workstations, scanners and storage devices.

Similarly, Kodak's top executive said the company will seek to be a world-class provider of film, digital and hybrid imaging technologies. Four weeks ago, Kodak restructured, separating its digital electronics and film groups.

"We're going to try and empower the organizations to compete in the marketplace," said Kodak Chief Executive Officer George Fisher, who joined the company late last year from Motorola, Inc., where he also served as CEO.

Fisher said Kodak will emphasize customer solutions using the most appropriate media. Nevertheless, in five or 10 years, Kodak will still be "heavily committed" to film, he predicted.

## Dell

CONTINUED FROM PAGE 51

month, for example, the company introduced six network-ready servers based on Intel's 90- and 100-MHz Pentium processors. Dell is in the process of expanding its reseller network to handle those systems.

"If you are in a category-entry mode, you have to get aggressive," said Eric Harslem, senior vice president of Dell's product group. He said Dell will focus first on major accounts that "tend to be more self-sustaining" and then work its way into other server market segments.

As it seeks to add value to its product line, the company has begun to actively search for systems integrators, value-added resellers and service providers to support its new servers. Dell will offer fully integrated bundled hardware solutions with preloaded software, network management features and peripheral support on all its servers.

Dell has also beefed up its toll-free phone lines and will offer users a three-tiered level of fee-based support, including network operating system and server support.

### Resellers take notice

It is an attempt that has caught the attention of the reseller community with which Dell has sometimes had less than friendly relationships in the past.

Dell "didn't want resellers all these years. They competed against them," said Joe Barr, networking product manager at Entex Information Services, a \$1.2 billion provider of PC and network solutions in Rye Brook, N.Y. He said he doubted that Dell would be able to leverage its direct marketing/desktop computer experience successfully in the

more support-intensive server market.

Currently, nearly 65% of Dell's business comes from Fortune 500 companies and the federal government. This is where Dell's immediate server focus will be, according to Harslem.

Analysts said it was too early to comment on Dell's decision to go straight for the corporate segment. "Customers are getting used to a lot less hand-holding in the server market," said Lynn Berg, an analyst at Gartner Group, Inc. in Stamford, Conn.

According to Berg, Dell is trying to capitalize on the growing standardization among server vendors and should be able to deliver servers to the corporate market using its direct sales approach.

### Beyond Intel

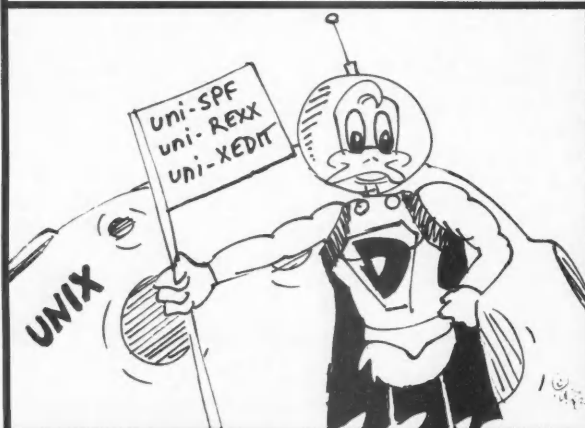
Part of Dell's new focus includes a willingness to explore other chip manufacturers and processors. Sean Burke, Dell's director of product marketing, said Dell is currently "all Intel," but it has been actively working on products based on the PowerPC chip and Digital Equipment Corp.'s Alpha as well as Intel clones from companies such as Advanced Micro Devices, Inc. and Cyrix Corp.

Burke made it clear that Dell would not continue to be tied to the Intel road map indefinitely and that products from alternate vendors could form the basis for future Dell products. "It will be foolhardy for us to think that Intel is the only microprocessor vendor," Burke said.

Dell acknowledges having developed and tested systems running on alternative processors in its labs but stressed that it had no immediate plans to announce or develop products based on non-Intel chips or architecture.

Dell is prepared to announce products based on these processors as soon as it makes "business sense to do so," Burke said.

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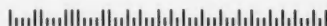
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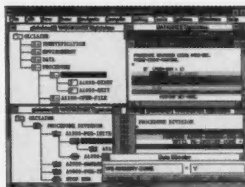


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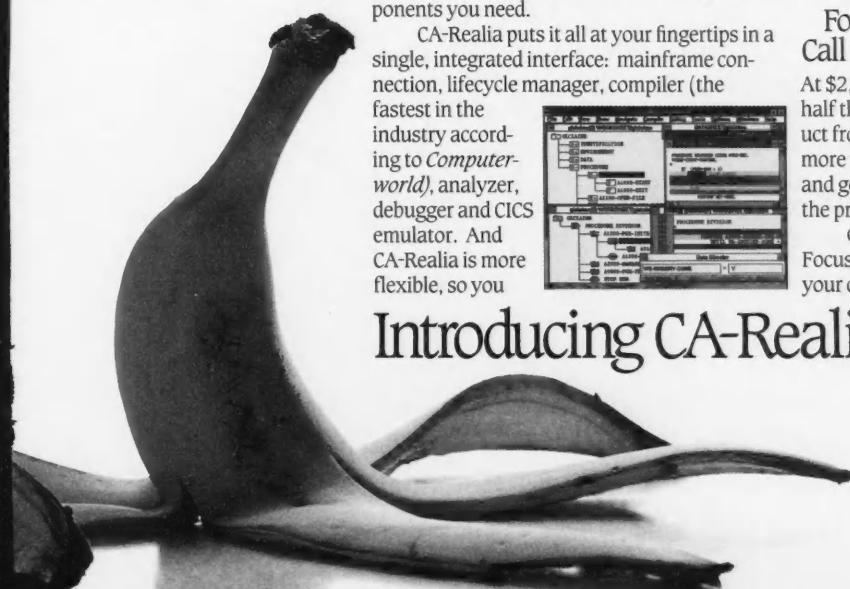
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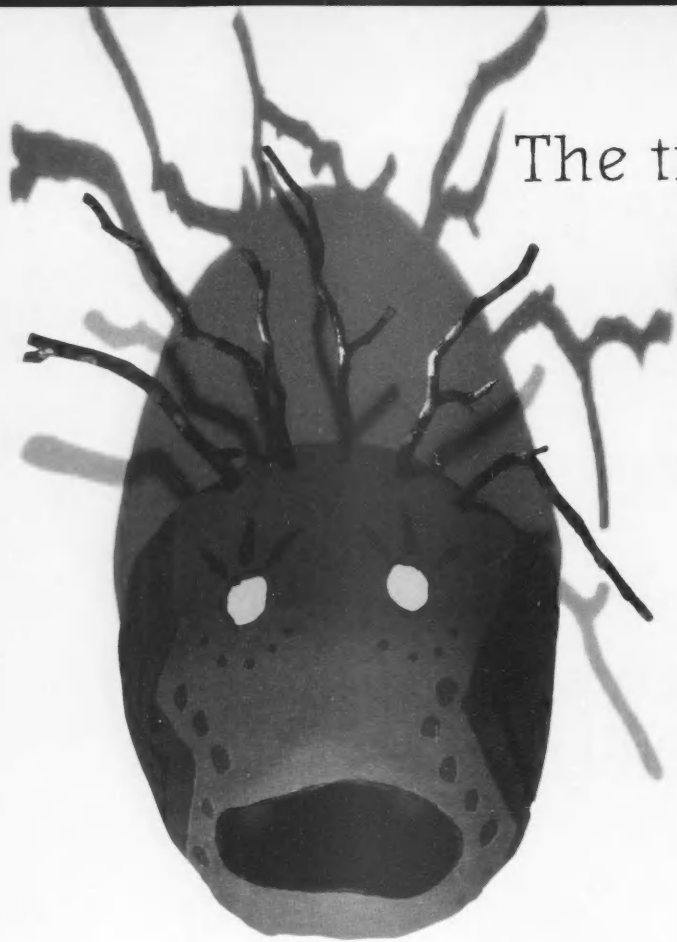
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## Frito, McCormick trade data

Notes database cuts WAN charges, enhances communication

By Lynda Radosevich

When Frito-Lay, Inc. runs low on nacho cheese seasoning for its Doritos chips, its trading partner McCormick & Co. already has a purchase order in hand. That is because the two companies trade inventory information and purchase order forms using a replicated Lotus Development Corp. Notes database.

Approximately three months ago, Frito-Lay built the Notes application, which performs inter-company transaction exchange functions similar to electronic data interchange (EDI).

The Notes application accepts inventory and purchase information from IBM's IMS database.

### Inventory exchange

Every night, Frito-Lay's Notes server calls McCormick's server and exchanges any changes in inventory and order information. This procedure replaces a cumbersome paper and fax process, according to Frito-Lay systems manager Lance St. Clair.

Unlike many EDI applications, the Notes system was fast and

easy to develop using Notes' built-in tools. "We packaged this up and had it running in a matter of months vs. probably a year for an

change business transactions is somewhat of an anomaly. Typically, companies use Notes internally for tracking electronic discussions, posting documents or building electronic workflow routines. Now, Notes is becoming more popular for business-to-business exchanges, industry experts said.

However, Notes is not a good platform for sending transactional data between the two companies because it does not conform with any existing EDI standards, according to David Taylor, vice president of electronic commerce at Gartner Group, Inc. in Stamford, Conn. (see related story page 62).

"The lack of standards is going to impede the ability of a company to roll out an application like this to diverse trading



EDI application with similar inventory and scheduling capabilities," St. Clair said.

Frito-Lay's use of Notes to ex-

## Firms seek to offer on-line multimedia

By Ellis Booker

Providers of on-line financial information are racing to offer their customers on-line multimedia featuring stored and searchable text, graphics, audio, images and, eventually, video.

Companies such as Dow Jones & Co., Reuters Holdings PLC and Bloomberg Financial Markets are pushing the envelope for how news and information is delivered to the desktop. They are seen as the earliest commercial providers of "information highway" services.

"The value of the information is higher in the financial services [market] than any other," said Andy Zimmerman, managing partner of the information communications consulting practice at Coopers & Lybrand. In this environment, he noted, a lead time of 15 minutes on breaking news can in some cases mean the difference between making or losing millions of dollars.

Zimmerman divides the customers for financial news and information into trading floors that function in near-real time and financial analysts and corporations, which have more time to conduct historical studies on markets and companies.

Multimedia news may be a dandy addition to the text and statistics brokerage houses now receive, "but the question is, how much will it cost, and how much will it cost to imple-

### Real growth

The real-time financial information market was \$4.5 billion in 1992, with projected revenue of \$4.8 billion in 1993, according to Simba Information, Inc. in Wilton, Conn.

On-line multimedia, page 63

Gary H. Anthes

## People processing



In an extraordinary example of networked collaboration, 600 volunteers on the Internet have performed a computational feat deemed virtually impossible a few years ago, even with a supercomputer.

Harnessing the power of a gaggle of mostly modest machines in 24 countries, the ragtag team of cryptography enthusiasts cracked an encryption code called RSA 129, a 129-digit number whose factors, or multiplicative components, had been a secret for 17 years.

According to Bellcore project leader Arjen Lenstra, the job would have taken 5,000 years on a 1 MIPS machine, and all

the computer time was free.

The fall of RSA 129 may or may not have important implications in the field of cryptography, and communications security is by no means the most interesting aspect of this stunning demonstration of parallel people processing.

Lenstra dissected the problem into many small chunks and sent them with special factoring software to volunteers armed with 1,600 computers, mostly PCs and workstations. In eight months, results flowed back to Bellcore, where they were checked and consolidated in two days on a Maspar Computer Corp. machine.

RSA 129 was cracked by a "metacomputer"—a loosely coupled and widely dispersed collection of individual computers working in concert. But instead of having just a processor at each node, the Internet metacomputer had both a processor and a person.

Putting "wetware"—people's brainpower—on the network gives a metacomputer special powers, says Barrett S. Caldwell, assistant professor of industrial engineering at the University of Wisconsin. "When you have people instead of processors, you have the opportunity for a unique, creative solution coming out of someone," he says. "You can't pre-

dict where it will come from, but chances are that creativity will emerge somewhere."

As it turns out, factoring RSA 129 was the sort of problem that lent itself less to creativity than to brute force, but Caldwell's kind of networked collaboration is emerging as a surprisingly effective way to get things done.

### Real-time review

Caldwell points out that in the traditional peer review process, years can elapse between the submission of a scientific article and its publication.

But networked peer review can occur in near-real time, speeding the advancement of science accordingly. For example, scientists were able to throw cold water on cold fusion claims within weeks, largely through Internet collaboration by hundreds of researchers.

Astrid Lipp, a lecturer at Clemson University, is applying parallel people processing to solve "undiscussable" problems—those so sensitive that participants in more traditional settings cannot be relied on to give forthright answers.

For example, a group of students using VisionQuest, a "goal-directed dialogue" tool from Collaborative Technologies Corp., engaged in confidential and anon-

ymous brainstorming sessions about problems with the Clemson academic honor code. Later, the group used the system to post its solutions. The results will be presented to the Clemson administration, Lipp says.

Andrew B. Whinston, a computer science and business professor at the University of Texas at Austin, says the emerging mobile software agents will accelerate networked collaboration by performing housekeeping chores—such as looking for and bringing back information on the network—while leaving the critical intellectual tasks to wetware.

But where intellectual tasks are minimal or nonexistent, it is not hard to imagine the disappearance of the distributed human element entirely.

Lenstra says RSA 129 could have been cracked in a weekend had it been attacked with a "computational virus." Sent surreptitiously over the Internet, the virus could have stolen cycles from thousands or millions of computers while their owners slept and then sent results back to a central point.

"For cryptographic applications, that could be very dangerous," Lenstra says.

Anthes is *Computerworld's* senior correspondent in Washington.

## Visa, Metricom reach out to faraway places

By Michael Fitzgerald

It is sort of like passing up U2, Madonna and Phil Collins to buy a Smashing Pumpkins CD, but Visa International, Inc. said it will work with Metricom, Inc., a relatively unknown wireless vendor, to develop targeted wireless networks.

Visa has broad tastes in communications, and the decision to work with Metricom does not preclude the company from using Cellular Digital Packet Data or other wireless formats, according to officials. It plans to use Metricom's campus-type microcellular networks to cover areas with little or poor telephone service, such as Latin America, and feed into VisaNet 2000, Visa's worldwide network.

"Wireless offers an opportunity for Visa to improve electronic transactions at the point of sale [and] make it faster and more accurate," said Dennis Moser, senior vice president of acquirer systems at Visa in Redwood City, Calif.

### Opening doors

He said that wireless networks such as Metricom's should allow Visa to provide better customer service in foreign countries with poorly developed telephone systems.

For example, in some countries a ceiling is placed on credit card purchases because telephone authorization is next to impossible. Therefore, a customer with a credit limit of more than \$800, for example, would not be able to use it.

Moser said Visa's goal is to roll out a Metricom network starting in 1995. However, it needs to have Metricom-capable point-of-sale terminals in place to do this. One such company, VeriFone, Inc. in Redwood City, Calif., has demonstrated a Metricom-capable network and could deploy its terminals whenever Visa wants, said Joseph Savage, vice president of the

network systems business at VeriFone.

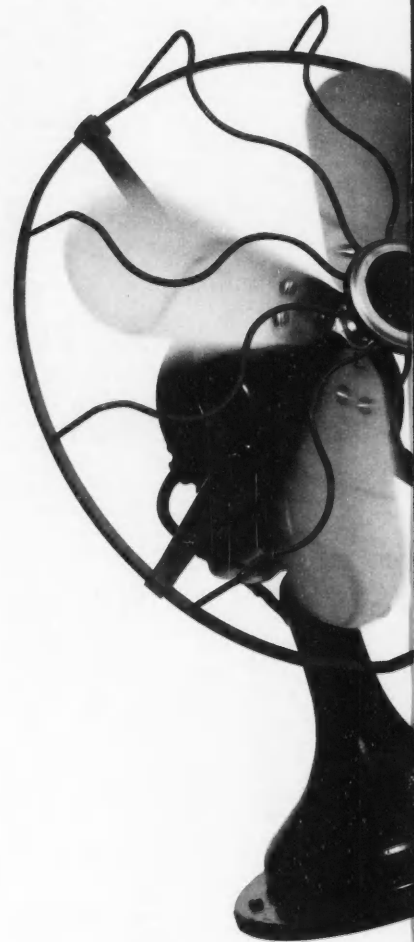
In order to deploy the terminals in the international markets, Metricom, best-known for networks it has built at utilities, has to create an international presence for itself. Metricom President Robert Dilworth said the company is negotiating in the UK, Hong Kong, Germany and South America and is looking

to sign up local partners.

Dilworth said that Metricom's networks can potentially be less expensive than dedicated telephone lines. For 2,400 bit/sec. communications, Metricom provides unlimited service for \$3 a month. For a full 77K bit data rate, costs are \$20 per month.

Visa is Metricom's first commercial customer outside of the vendor community; Microsoft Corp. and Lotus Development Corp. are also customers.

# D r E A m



**Trellis** has introduced the Application Meter 3.0, a product designed to provide control over limited license applications and suites of applications.

According to the Southboro, Mass., company, the product runs on a Banyan Systems, Inc. Vines server. It enables users to configure metered applications and application suites via a Windows facility that defines who may use the applications based on Vines' StreetTalk directory service of user names.

Trellis Application Meter 3.0 costs \$995 for a single-service license.

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**Knozzall Systems, Inc.** has introduced FileAuditor, a file activity tracker.

According to the Chandler, Ariz., company, FileAuditor gives network administrators the ability to track all the files on the network. The product tracks actions that include create, delete, move, rename, salvage and purge.

FileAuditor offers extensive reporting capabilities and requires an IBM PC or compatible, Novell, Inc.'s NetWare 3.1x or higher and Windows 3.1 or higher.

FileAuditor costs \$395.  
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## Reporter's

## Notebook

Here are some items of interest from the recent Electronic Messaging Association conference held in Anaheim, Calif.:

Part of Novell's plans for its Global Message Handling Service (MHS) is a univer-

sal message storing capability, according to product manager Ron Cully. Applications that currently run on MHS, such as **Da Vinci Systems'** E-mail product, have their own message storing capabilities. A single message storage database would let users look at messages from different applications, such as E-mail, forms routing and calendar programs, in one spot. The plans fall in line with what other messaging vendors, such as **Lotus** and **Microsoft**, have in store.

While LAN vendors tout their "cross-platform" capabilities, users with a mix of Unix desktops and dumb terminals might not agree. At best, the major PC LAN E-mail vendors only support a couple of Unix desktops. For those sites, **Z-Code Software Corp.** in Novato, Calif., introduced E-mail client software that runs on character terminals, Macintosh and Windows, in addition to the 13 kinds of Unix and DOS that it supports. The clients plug into standard Simple Mes-

sage Transport Protocol or X.400 message transfer agents. A built-in scripting language permits developers to create filtering and workflow applications.

As expected, **SoftSwitch, Inc.** and **Microsoft** agreed to tightly integrate the **SoftSwitch EMX** messaging switch with Microsoft's forthcoming Enterprise Messaging Server (EMS) [CW, Feb. 28].

The combination is aimed at large firms that plan to use EMS as a departmental messaging server and need a multiprotocol switch to integrate many different kinds of messaging systems. **SoftSwitch** is planning to pen a similar arrangement with **Lotus** and **Banyan**, according to sources.

Open systems vendor **OSIware** in Burnaby, British Columbia, introduced X.500 messaging-based directory service software that lets users look up addresses across dissimilar messaging services.

Plug-and-play E-mail could be further away than previously thought. Despite **Microsoft's** indication that its so-called "universal" E-mail client will be able to act as a front end to **Lotus'** Notes and CC:Mail servers, building that capability is up to **Lotus**. But **Lotus** officials said they aren't sure if they will build support for Messaging Application Programming Interface (MAPI) 1.0, which enables the connection, into the first version of the **Lotus Communications Server (LCS)**, due in early 1995. Likewise, they are not certain if they will build support for MAPI into initial CC:Mail clients for LCS. If not, the two vendors' upcoming client and server software won't plug and play.

**HP**, which appears to be gaining ground with **HP OpenMail**, has scored a major contract with **Shell Oil**, which has chosen **OpenMail** as the basis for a massive messaging network, an **HP** source said.

—Lynda Radosevich



28

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## Data interchange

CONTINUED FROM PAGE 59

partners without forcing them all to have Notes," Taylor said.

By extending Notes beyond basic collaboration and into transactional applications, Frito-Lay is pushing Notes beyond what analysts and Lotus advocate, Taylor added.

St. Clair conceded that Notes may not work for large-scale EDI-type exchanges, but for Frito-Lay's application, the benefits outweigh any standards issues. In addition to reduced development time, he cited the following benefits:

- **Reduced wide-area network charges.** The nightly Notes replications go out over a dial-up connection costing "pennies" rather than an EDI value-added network (VAN), which charges roughly 50 cents per transaction.

- **More useful exchanges.** The data looks good once it gets there, and McCormick can slice and dice the information using Notes' viewing methods.

- **Better communications.** Traditional EDI sends structured information only, whereas Notes can handle images and unstructured documents such as memos.

While these benefits are compelling, the application is not suitable for high-volume transactions because Notes' servers are

only occasionally connected, St. Clair said. For dynamic transactions, such as ordering potatoes from potato farmers, the company is setting up an EDI system. But seasoning is not ordered as often, so Notes makes a lot of sense, he said.

### Testing ground

For its part, McCormick is using the Frito-Lay application to test Notes as a platform for other trading partners with similar applications.

"This is a small-scale approach to see if it works," said Nancy Valentine, materials manager at the McCormick seasonings division. "A lot of people were concerned with

the standards issue, but we decided to just get something going to try it."

Lotus could make life easier on companies such as Frito-Lay and McCormick by partnering with EDI translation software vendors or EDI VANs so the Notes database could work with standard EDI forms. "I'm really hoping that we'll be able to combine Notes on the front end to EDI at the back end," St. Clair said.

Lotus has not stated plans to do so.

Meanwhile, Notes has been valuable in teaching Frito-Lay how to model applications, and "if it doesn't work, we still got some benefit out of it in the short term, and we can just throw it away," St. Clair said.

## Using Notes

**W**ith public Notes service expected from AT&T Corp. this summer, analysts predict that more businesses will use Notes for intercompany communications.

One option is as a supplement for EDI. "It would be great" if there was an electronic-mail component to EDI "so we could send Notes messages with the EDI transaction," said Richard Lester, vice president of information services at Associated Grocers, Inc. in Seattle.

For its part, Lotus has long held that Notes' strength is not exchanging transactional data. Rather, the groupware is best at exchanging unstructured information such as documents, images and electronic conversation threads.

On the other hand, Lotus is tightening its links to SQL databases with its forthcoming Notes VIP programming tools, making it easier to link Notes to transaction processing systems.

And if the AT&T Notes network is the success Lotus hopes for, companies are likely to question why they need separate EDI and Notes networks.

—Lynda Radosevich

## Briefs

### Virtual network

NetEdge Systems, Inc. in Raleigh, N.C., said it will deliver this month the first enterprise-wide virtual network routing capabilities for Asynchronous Transfer Mode (ATM) networks. NetEdge's ATM Connect Release 1.1 software will allow users of its line of ATM routers to form workgroups of up to 250 Ethernet, Token Ring, Fiber Distributed Data Interface (FDDI) and ATM devices located anywhere in the enterprise.

### ATM connector

Fore Systems, Inc. announced a LAN access switch designed to connect Ethernet, Token Ring and FDDI LANs to ATM networks based on its ForeRunner ATM switch. Pricing for the Fore Systems switch, which is scheduled to ship next month, starts at \$20,995.

# Now there's an easier way to access without losing touch with y





## On-line multimedia

CONTINUED FROM PAGE 59

ment?" asked Alan Lam, vice president at Chase Research and Information Services, an arm of The Chase Manhattan Bank N.A. Currently, Chase subscribes to a news clearinghouse that sends more than 100 text news feeds to a central server, which in turn distributes the incoming information to some 400 networked workstations.

Beyond additional charges, Lam noted that the bandwidth requirements of multimedia would likely require new wiring or hardware at additional cost. Nevertheless, Chase has scheduled some appointments to view these types of enhanced on-line systems "and see if we can use them here," Lam said.

### Multimedia leader

One of the furthest along in the multimedia front is Bloomberg Financial, a 12-year-old company based in New York that hopes to give its 36,000 business subscribers worldwide video clips along with text, audio and still images.

As of last summer, about half of Bloomberg's subscribers had access to audio and still images via their proprietary Bloomberg terminals. Bloomberg executives declined to discuss the multimedia

projects, though they confirmed that interactive video is an area of interest.

At Dow Jones, several units are pursuing multimedia projects. This includes an interactive edition of *The Wall Street Journal*. The Dow Jones Investor Network, a service launched last fall, sends video news, interviews and live press conferences to IBM PCs outfitted with VGA graphics and an IBM PS/2 TV device.

The Dow Jones Investor Network video is distributed to subscribing PCs over coaxial cable and routed through a Token Ring LAN. The picture is displayed either as a one-eighth screen or a full-size screen.

Designed for commercial investors, the network is not cheap. There is a one-time \$1,500 installation charge and a \$750 monthly per-site license fee, which grants the site up to three terminals. The service itself, which broadcasts three to five video events per day for a total of two or three hours of material, can be received via either satellite or a dedicated phone line.

While the Dow Jones network is a broadcast service, it does not offer stored media. Subscribers are "alerted"

to upcoming broadcasts. A multimedia version of the service, which was developed with Nynex Corp., is being rolled out to beta sites. Dow Jones will not reveal when it expects to commercialize it.

Dow Jones Telerate in Jersey City, N.J., is working with the Dow Jones network to deliver video to its customers on the trading room floor.



JOHN BAZZANO

At Reuters Holdings, which operates 125 news bureaus worldwide and has served both the financial industry and the news industry since its founding 140 years ago, a video service to PCs will be launched throughout Europe next month. That service, targeted at foreign exchange traders, will eventually come

to the U.S., although no time frame has been set, according to a spokesman.

Convinced that multimedia-type services will be a reality and an important future market, Reuters formed Reuters NewMedia, Inc. in January. The subsidiary will look to exploit business opportunities in nontraditional markets such as on-line information networks and interactive cable systems, as well as the educational and health care industries.

### Hard to measure

It is difficult to gauge the demand for multimedia services. Zimmerman suggested that the addition of audio, image and video content to interactive news may be a way for companies in this fiercely competitive industry to differentiate their services.

"Technology in the past has had a marginal and transitory impact" on trading room floors, Zimmerman said, noting that inertia in this environment is significant and that the advantages have to be "quite dramatic" to persuade a stock trader to replace his existing system.

"I think they're all struggling to differentiate on things other than content, since there is only so much content they can buy, especially on an exclusive basis," Zimmerman said.

Computerworld *Mid-Atlantic* senior correspondent Thomas Hoffman contributed to this report.

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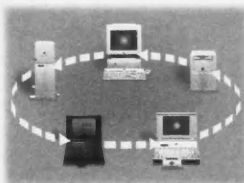
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# Large Systems

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CA-WAREHOUSE BOSS 4.0 SHOWS  
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## Entergy overhauls to avoid vendor lock-in

By Jean S. Bozman

■ Entergy Corp. is creating a plug-and-play architecture in which mainframes, PCs and Unix-based file servers all work together, reducing reliance on any one hardware vendor.

In fact, in the new scheme of things, the utility company — which claims to be one of the Top 10 utilities in the country — is tearing out hundreds of Novell, Inc. NetWare LAN servers.

Chief Information Officer Dennis Walsh said the planned switch from NetWare LANs to Unix file servers accessible from the company's 10,000 PCs — most of which are equipped with Windows — is meant to keep Entergy flexible as it grows and save it money (see story at right).

With its acquisition of Gulf States Utilities Co. in December, the \$6.2 billion New Orleans-based Entergy must prepare its central information systems infrastructure to support the new business unit's computers, Walsh noted.

"One of our objectives was to build an architecture that allowed us to plug and play with whatever was needed to support the busi-

### ON SITE

Entergy Corp.  
New Orleans

**Challenge:** To create a plug-and-play architecture in which reliance on specific hardware platforms or operating systems is minimized and to use mainframes, Unix servers and desktop PCs in a client/server architecture that is evolving to distributed computing.

**Strategy:** Use enterprisewide networking to deliver shared data to users' desktops; maintain a flexible IS resource so applications in each business unit can be changed easily.

ness," said Walsh, who joined Entergy in 1991 from equipment maker J. I. Case Co. in Racine, Wis., a Tenneco, Inc. subsidiary. "Because of the rate at which technology is changing, you don't want to be locked into a technology infrastructure."

#### Relying on Unix

Entergy intends to take advantage of all styles of computing without being beholden to any one. It is baking a three-layer cake of enterprise computing, one that links PCs, Unix servers and IBM mainframes with a frosting of middleware and client/server links.

Entergy's philosophy of flexibility includes using distributed servers to boost uptime for user applications on the enterprise network. "Before, if the mainframe went down, everybody's [computing resource] was dead," said Randy Pledger, Entergy's director of database administration. "Now, if you distribute everything among 10 servers on a TCP/IP network and the mainframe goes down, everybody's still working."

Unix servers constitute the new linchpin in the firm's enterprise networking initiative, acting as

Entergy, page 72

### Adding it up

The campaign to replace Novell file servers began about 18 months ago, as Entergy sought to cut costs and build an enterprise network that could be reconfigured as business needs changed.

The firm has nearly 300 NetWare 3.1.2 servers and 17,000 NetWare user IDs. But a multi-step program will drastically reduce the inventory of NetWare servers, leaving an isolated few for department-only applications by 1996.

Cost is a key concern. Each NetWare server costs about \$20,000 in hardware and peripherals and about \$8,000 for the 250-user software license, said Entergy's director of systems design, Cliff Triplett. Supporting the IPX/SPX protocol stack takes up to one-third of available bandwidth on a remote site's 56K bit/sec. network link, he said.

The need to copy NetWare directories onto multiple servers

is another concern for corporate-wide applications. Every time the number of users for a NetWare application exceeds the 250-user limit in the software license, Triplett said, the directory has to be copied onto another server. "We're trying to retrofit and eliminate all dependencies on Novell, beyond single workgroups, by October."

The alternative, IS managers said, is to use enterprisewide TCP/IP networks with multipurpose Unix Network File System servers. In place of NetWare's file and directory services, Entergy plans to use elements of the Open Software Foundation's Distributed Computing Environment (DCE) and related software from other sources. The first element deployed will be a Domain Naming System — which originated on the Internet — along with DCE's timing service for synchronization of updates and security.

— Jean S. Bozman

## Users face dearth of warehouse management tools

Storage option finds increased popularity, but few vendors deliver

By Rosemary Cafasso

Although data warehouse management products are hitting the market, users still do not have an abundant supply from which to select a tool set that best suits their individual environments, industry observers said recently. This is especially crucial in the client/server arena because distributed environments often do not have the built-in system integrity and reliability of the mainframe world, observers added.

"We are evaluating tools now," said Brenda Moncla, a manager of data architecture at Hughes Aircraft Co., which is doing warehouse work on both IBM mainframe and RS/6000 platforms. "We've run into things like what happens in terms of notification when a load doesn't work properly or files aren't transmitted? There's a lot more work to be done in Unix. Things like scheduling and job notification are pretty much automated on the mainframe."

#### Picking up steam

Data warehousing, with its roots in mainframe computing, is based on the concept of setting up a separate end-user database that contains cleaned-up copies of production data. The purpose is twofold: to make data more available to end users and to avoid queries to the production systems.

Warehousing is catching on in client/server environments, in part because servers often offer a more practical and cheaper platform for this end-user database.

The mechanics of warehousing call for extracting, cleaning and transferring data and then populating warehouses with it. That creates a tremendous management challenge to make sure that users do not end

up with inaccurate data copies and that the organization is not littered with redundant copies.

Miles, Inc. in Pittsburgh has been involved in warehousing since 1989 and now manages both IBM DB2 mainframe-based and

Oracle Corp. server-based warehouses.

"Management of distributed data in a warehouse is on the front lines," said Robert Typanski, manager of applications system support at Miles. "We consider it crucial to the viability of warehousing. Without it, you have only old-style extract files."

Miles currently uses Texas Instruments, Inc.'s Information Engineering Facility development software to create data models for its warehouses and a management tool from Prism Solutions, Inc. to generate data for the warehouses based on the information contained in the models.

Industry analysts said various warehouse manage-

ment tools are currently shipping, although many are point products addressing specific warehouse tasks, such as extracting.

"IBM and HP are really the only ones out there" with management tool sets, said Kevin Strange, a program director at Gartner Group, Inc.'s Santa Clara, Calif., office.

#### Total package

Of the management tools now shipping, Hewlett-Packard Co. appears to offer the most all-inclusive package. Its Intelligent Warehouse Solution includes warehouse security, maintains meta data about the warehouse and has such functions as a user query monitor that blocks requests to data that is not yet prepared.

The downside, however, is that it is an all-in-one proposition that requires users to buy the Intelligent Warehouse package, which is an entire warehouse deployment and includes HP consultation. Prices range from \$120,000 to \$400,000.

The other potential big player is IBM, which plans staggered releases over the next several months of several warehouse management tools to handle data propagation, replication and the movement of data edits. In addition, its Data Guide tool, scheduled for general availability by the end of next month, will maintain a catalog of information about a warehouse environment.

Strange said the potential downside to the IBM lineup is that "it is primarily DB2-oriented."

WAREHOUSE  
data

# ISSC grabs another railway in Amtrak outsourcing deal

By Mark Halper

Citing a need to free capital for core business improvements and a desire to quicken technology changes, passenger railway Amtrak recently signed a 10-year, \$509 million outsourcing contract with IBM's Integrated Systems Solutions Corp. (ISSC) subsidiary.

The accord, signed April 1, will displace about 100 of Amtrak's 300 information systems workers.

Amtrak end users said they do not expect disruptions in their workaday lives but foresee technology becoming more readily available to them. At the same time, at least one end user pointed out

## All aboard

ISSC is partnering with Covia Technologies to develop passenger handling, scheduling, reservation, ticketing and fare software for Amtrak.

that he will have more accountability in terms of implementing and paying for technology.

David Wine, director of system operating schedules, noted that before the outsourcing

contract, cost estimates for projects were conducted at the corporate level. "Now, we're going to have to go [to ISSC] and get a cost estimate," he said.

Wine welcomed the change, noting it should enliven Amtrak with a more entrepreneurial spirit.

And although Amtrak will retain approximately 200 IS workers for application development and other functions, Wine noted that Amtrak department heads are likely to seek development assistance from ISSC.

## One railway, now two

ISSC beat out Electronic Data Systems Corp. and Perot Systems Corp. for the Amtrak deal. Scott Flower, a railroad industry analyst at Kidder, Peabody & Co. in New York, pointed out that ISSC's outsourcing victory at freight railroad company Southern Pacific Lines last fall [CW, Nov. 15, 1993] probably influenced Amtrak to pick the IBM subsidiary.

"Government agencies tend to be more risk-averse. Having somebody go ahead of you probably helps ease the decision process," he said.

Amtrak's outsourcing comes amid a broad re-engineering evaluation and will eventually support a restructured organization, said Don Gentry, Amtrak's vice president of IS.

The outsourcing contract itself involves a dose of re-engineering: Amtrak has asked ISSC to propose new methods and technologies for reservation systems, passenger revenue collection and accounting systems, Gentry said.

ISSC Chief Executive Sam Palmisano said his company is working with IBM's consulting group on that project. The re-engineering portion marks the latest example of the merging of the outsourcing and re-engineering worlds [CW, April 11].

While the \$509 million price tag includes the IBM evaluation, it does not include implementation of whatever systems ISSC would deploy to support those operations, Gentry said.

It does include data center operations, disaster recovery services, voice and data network services, help desk and PC and LAN support, Palmisano said.

Gentry said the outsourcing accord will free about \$70 million in capital expenditures on computer equipment that Amtrak would have to spend if it were to keep IS operations in-house.

Including the capital savings, ISSC will save Amtrak a total of \$100 million over the course of the contract, according to Gentry.

ISSC is offering jobs to about 65 Amtrak employees, mostly data center workers who would have to relocate from a 200-MIPS Amtrak data center in Philadelphia to ISSC mainframe data centers in Manassas, Va., or Boulder, Colo., Gentry said.

Another 35 workers will be reassigned within Amtrak to either IS or non-IS jobs.



# CA scores hit with warehousing package

By Thomas Hoffman

Computer Associates International, Inc.'s upcoming CA-Warehouse Boss 4.0, an enhancement to the software giant's automated IBM AS/400-based warehousing package, has drawn praise from some early users.

CA-Warehouse Boss 4.0, which links

supply-chain planning with warehouse management functions via system-directed radio frequency links, recently entered beta testing and is scheduled to ship in July.

Ecko Housewares, Inc., a Franklin Park, Ill., division of Nashua, N.H.-based Ecko Group, Inc., has used other RF-based warehousing systems for the past

eight years, according to Charlie Dietz, vice president of information systems at Ecko Group. The housewares manufacturer chose to replace those systems with the latest release of CA-Warehouse Boss because of features such as dynamic parceling and Uniform Classification Code-128 bar code support, Dietz said.

Plus, CA-Warehouse Boss 4.0 was being offered at a more cost-effective price than other packages, Dietz said. "On a price/performance basis, Boss is very attractive," Dietz said. His organization recently began installing the package and expects to have it fully operational by July. "You can spend up to three or four times as much money for a warehousing package with slightly more functionality," he said. Ecko spent \$100,000 to \$200,000 to purchase the CA package for its IBM AS/400 Model 45 machine. Dietz said he previewed other competitive packages that start at \$1 million.

## Users rave

St. Ives Laboratories, Inc., a Chatsworth, Calif., manufacturer of hair and skin care products, has been testing CA-Warehouse Boss 4.0 for the past five months. The company has completed 75% of its new RF-driven distribution center as part of its move to a paperless warehouse where CA-Warehouse Boss "will be the brains of the new system," according to Tim Mahoney, project manager for the firm's distribution center.

Mahoney, who looked at other warehousing packages with RF features, said he was impressed with CA-Warehouse Boss' RF features and product location algorithms. Mahoney said he was particularly impressed by feedback from other CA manufacturing software users.

Tony Baer, a senior analyst at Advanced Manufacturing Research, Inc. in Boston, called CA-Warehouse Boss 4.0 "one of the most functional of the stand-alone warehouse applications." However, Baer added that CA needs to provide better integration between CA-Warehouse Boss and CA-PRMS, its flagship manufacturing package.

Dietz agreed that the two packages are not completely "integrated," but he said CA-Warehouse Boss was "interfaced" closely enough with CA-PRMS for his organization's needs. "The only thing lacking [with CA-Warehouse Boss] is an item master that can run on both packages, but that's not really a big issue for us, and I don't think it would be for most users," he said.

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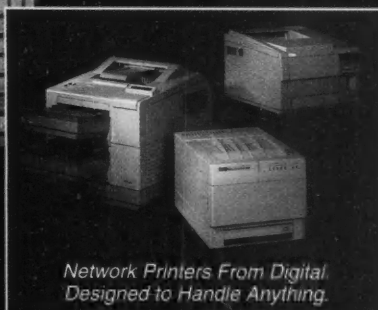


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## Large Systems

### Entergy

CONTINUED FROM PAGE 67

shared servers for PCs and as links to mainframes that hold the central customer database. The servers, which host relational databases from Oracle Corp. and Sybase, Inc., include 11 Sun Microsystems, Inc. SPARCcenter 2000s, seven SPARCserver 1000s, six IBM RS/6000

servers and one Hewlett-Packard Co. HP 9000 T500 Unix server.

The relational databases now store enterprise data for access by client/server applications. Over time, they will hold more of the customer databases needed to run the utility. These databases currently reside on IBM mainframes. The Unix servers use IBM 3270 emulation to access the mainframes' IMS databases and use database gateways to access IBM's DB2 database.

Applications will be written to run on top of many operating systems. "By the end of the year, we will not even be dependent on any [one] operating system," said Clif Triplett, director of systems design and telecommunications. "We can move applications across anyone's iron and across almost anyone's operating system." Even so, the portable applications will have to be recompiled to run on different hardware platforms.

Entergy's first corporatewide applica-


tion is a budgeting application. Also under development is a work management application for the utility's customer service groups that accesses a Sybase database. The company is already using the Oracle Financials package on some Sun servers.

Through all the changes in Entergy's IS architecture, mainframes will stay on-line. However, the number of mainframes is expected to be cut from three to one by 1996 as applications migrate to Unix servers. "We think the mainframe is still viable technology for the things it does well, like processing [the] batch work for 2.5 million bills," Walsh said.



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**Multi Soft, Inc.** has announced the Windows Communications Library Enterprise Server Option (WCL/ESO).

According to the Monmouth Junction, N.J., company, WCL/ESO has an Open Server capability that allows the mainframe to be used as a transactional server from any Windows or Win-OS/2 development platform that can call Dynamic Link Libraries (DLL).

The product offers high-level client/server functions to the PC client through DLL calls and provides the same functionality at the mainframe under CICS via application programming interface calls.

Host component prices for the WCL/ESO product range from \$22,500 to \$195,000.

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#### Product short

**ICL** has announced team server and superserver client/server systems. The systems comprise 25 models ranging from entry-level servers for small to medium-size businesses to large corporate servers that can support hundreds of users. Cost: starts at \$4,100. ICL, Irvine, Calif. (714) 855-5500.

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# Application Development

OCR TOOLS, 78  
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## Developer's kit debuts for 32-bit move

By Melinda-Carol Ballou

Developers who have had early access to Microsoft Corp.'s Control Developer's Kit for creating OLE Custom Controls said the technology looks promising. They particularly liked the kit's ability to help smooth the transition from 16-bit controls to 32-bit applications.

Custom controls for Object Linking and Embedding (OLE) are preprogrammed chunks of code that handle specific functions. Developers can incorporate these controls rather than create the code from scratch. Approximately 500 independent software vendors have created 16-bit controls for Visual Basic, called VBXs, according to Microsoft.

Microsoft is taking the concept and applying it to OLE to help vendors and users incorporate 32-bit technology. The developer's kit will be offered as an add-on to Microsoft's Visual C++ 1.5 for creating 16-bit applications and to the next version of C++ for 32-bit controls.

Developers who want to migrate their VBXs to OLE will be able to do so. An option in the developer's kit, Control Wizard, will allow them to create a VBX template from which they can build OLE

controls, according to officials.

The developer's kit is scheduled to ship later this quarter. Prices will be announced at that time.

The OLE controls are key to moving forward with Microsoft because VBXs will not be supported on 32-bit platforms, and "you need some way of doing them," said Larry Harris, technical manager at Quick America Corp., a New York market data provider. And while Microsoft has made beta copies easily available to part-

ners, it has not been so forthcoming with its competitors, industry sources said [CW, May 2].

The OLE controls represent a "modular way to go about programming and delivering components" that will lead to "reusability at a much higher level," said Beau Riedel, a software engineer at Tencor Instruments, Inc., a semiconductor vendor in Mountain View, Calif. Migrating the VBX controls "will be a major concern" for some people, he said.

Some who have made the transition said it was not as onerous as they had feared.

"We were amazed at how easy it was vs. what we thought it might be like," said Chris Mahoney, vice president of research and development at Visual Tools, Inc., a software firm in Lenexa, Kan., that beta-tested the developer's kit.

### Difficult move

According to Joe Modica, vice president of research and development at Sheridan Software Systems, Inc., a Melville, N.Y., software company, developers will be "pleased with the final release" of the developer's kit, although the process of moving VBX controls over can be tedious.

"There's a lot of hand porting and decision-making as you bring bits of code over. In theory, going from 16- to 32-bit should just be a recompile if you've done things legally," he said. "But if most of your controls were written in C, as ours were, bringing them over to the [OLE Custom Controls] model in C++ means deciding whether you want to convert it to take advantage of C++ or keep it as C code."

### Custom wizardry

The Control Developer's Kit for OLE will also include the following features:

► **Control Wizard**, which automates the first steps of building an OLE Custom Control and creating a skeleton control with ready-to-use standard interfaces.

► **Microsoft Foundation Class (MFC) Control Extensions**, which extends MFC 16- and 32-bit libraries

to implement standard OLE control interfaces.

► **Class Wizard**, which extends the Class Wizard in Visual C++ to automate the connection of an OLE Custom Control's properties, methods and events to MFC library functions.

► **Test Container** for testing control methods, properties and tool palettes.

► **On-line documentation** and sample controls.

## Multimedia kiosks provide voter education in South Africa election

By Mitch Betts

■ When an election involves about 16 million first-time voters and 19 political parties, the task of voter education is a daunting one. But the historic election in South Africa had some help from advanced multimedia kiosks throughout the country.

The interactive touch-screen kiosks followed the same format as the South African election ballot, providing all the detailed information voters needed to make an informed choice. A total of 30 kiosks were rotated around the country at 70 different sites.

The first menu of the Voter Education Kiosk, created by Sandenbergh Paxon Ltd., a multimedia development firm based in Johannesburg, provided basic information on why, where and when to vote.

"We tried to make the kiosk as graphical and simple as possible since many illiterate people will be voting for the first time," Margot Sandenbergh, director at the company, said in

a written statement.

Each kiosk, consisting of a 14-in. color monitor and Intel Corp. i486-based PC, featured color photos and one-minute digital video messages from the candidates and mission statements from the political parties. The kiosks also explained the role of independent election observers such as the United Nations.

Sandenbergh said well over 1 million people have used the kiosks since they were rolled out in February.

The kiosk application was created using IconAuthor, a multimedia application development system from AimTech Corp. in Nashua, N.H., which allows developers to combine text, high-resolution graphics, animation, full-motion video and sound for interactive presentations.

"IconAuthor's flexibility allowed us to continually update the application as the political landscape changed here," Sandenbergh observed. For example, a digital video



Multimedia kiosks help educate voters in a country where many voters cannot read



South African voters used a touch screen to learn more about political parties and how, when and where to vote

message from the Inkatha Freedom Party had to be added when the party joined the election at the last minute.

Similarly, two other parties changed their names late in the campaign. "Both recorded new messages... and we quickly updated all kiosks in the field to reflect the changes," she said.

### Next stop: Europe and Asia

Sandenbergh's company got the ball rolling by creating a prototype of the kiosk application for South Africa's Institute for Democratic Education and then lining up two financial sponsors: the European Economic Community and the United Nations Economic Scientific and Cultural Organization (UNESCO).

"UNESCO is now lobbying in Paris to help create a number of similar projects using this multimedia kiosk technology across Europe and Africa," she said.

## ODBC driver kits upgraded

PageAhead Software Corp. in Seattle will ship by midyear upgraded versions of its Open Database Connectivity (ODBC) driver development kits.

SimbaEngine Software Development Kit 2.1 adds support for transaction processing, improves security and features performance enhancements. A corresponding version of its SimbaLib Soft-

ware Development Kit, also numbered 2.1, will add full support for ODBC 2.0.

SimbaEngine was designed for developers who want to write ODBC drivers for non-SQL databases; SimbaLib lets them write ODBC drivers for SQL databases. The SimbaLib kit lets developers write ODBC drivers that provide SQL capabilities to non-SQL databases, although all of

the processing takes place in the ODBC driver and not in the back-end application, a PageAhead spokesman said.

The firm is targeting customers who are "looking at downsizing but who may not want to spend the money for full-blown downsizing."

Prices for the upgrades, which are scheduled to ship during the first half of the year, have not been set. Prices for current versions start at \$10,000.

—Stuart J. Johnston

## Tools suite eases visual development

ProtoView Development Co. is shipping the ProtoGen+ Client/Server Suite, a bundle of development tools based on the company's visual development workbench.

The package features the ProtoGen+ workbench, which provides all the tools necessary to visually develop screens, create menus, tie screens and dialog boxes together, test applications and generate source code.

It also provides the SQL View database access product, which enables users to access most popular PC and large-scale databases including Paradox, dBase, Btrieve, Oracle, Sybase, SQL Server, Informix and DB2, according to the Dayton, N.J., company.

### No coding required

Another tool included in the package is the DataTable Spreadsheet Control and DataTable Lens Object. This allows users to browse and display large amounts of data in a row and column format and edit databases without coding.

The client/server suite also features a report writer and an expandable Windows Dynamic Link Library of controls to let users access, format and edit data.

ProtoView's ProtoGen+ Client/Server Suite costs \$1,795 but is currently available at an introductory price of \$995; current ProtoGen users can upgrade for \$595.

—Stuart J. Johnston

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### Brief

#### Object agreement

The Object Management Group late last month announced the adoption of its Persistent Object Services (POS), which provide the basic functions needed for maintaining objects across heterogeneous, distributed computing environments, according to OMG officials. POS resulted from the collaboration of 21 companies, including Hewlett-Packard Co. and Digital Equipment Corp., and allows an object to make all or part of its state persistent, the officials added.

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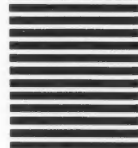
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# OCR tools help developers use scanned images

By Melinda-Carol Ballou

Nestor, Inc. has announced optical character recognition (OCR) tools that allow developers to incorporate data from faxed or scanned documents into applications. These products include OmniTools 1.0, NestorReader 2.0 and N'Route.

According to developers and information systems managers at Connecticut Mutual Life Insurance Co., OCR technology is just now becoming reliable and inexpensive enough for them to use.

The company is evaluating the Nestor tools, according to Roger Thibodeau, assistant vice president at the Hartford, Conn., insurance firm.

"They're now marketing to people like ourselves and letting us embed the engine as we need to," Thibodeau said. "One thing we discovered a while ago when we first got into imaging was that to be successful, we have to roll up our sleeves, get into the technology and be like systems integrators ourselves to leverage the power of the technology."

OmniTools 1.0 will allow Visual Basic developers to incorporate the OCR capabilities

of NestorReader tools into Visual Basic applications. The NestorReader 2.0 system allows users to automate the entry of handwritten and machine-printed information from faxed and scanned forms.

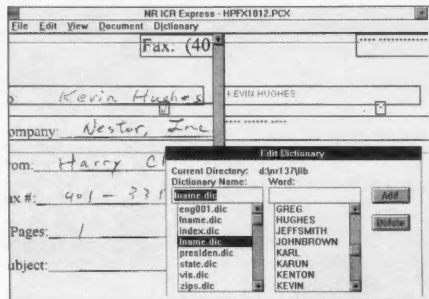
## Windows apps

Using OmniTools 1.0, users can develop applications integrating Microsoft Corp.'s Access, Excel, FoxPro and Lotus

Development Corp.'s 1-2-3, among other products, without doing any C programming.

OmniTools also offers simple calls to display images and Windows Dynamic Link Libraries (DLL). The tool also allows the image to be corrected once it has been scanned in.

"NestorReader previously targeted C developers — you had to be quite a bit of a techie to use it," said Ken Kleinberg, an analyst at the New Science service of Gartner Group, Inc., a consulting firm in Stamford, Conn. "Now with OmniTools [Visual Basic], you have DLLs, which are accessible to a great number of applications and developers."



Nestor's N'Route tool is a Windows utility that allows faxes and images to be routed automatically

He added that Nestor offers a "pretty advanced form of pattern recognition" that has let the firm create products that are a notch above competitive offerings.

## Better than before

NestorReader 2.0 offers higher recognition accuracy than earlier versions by using character and word segmentation and field-specific context and user dictionaries, Nestor officials said. It also performs document alignment and form and noise removal and discriminates automatically between hand-printed

and machine-printed characters.

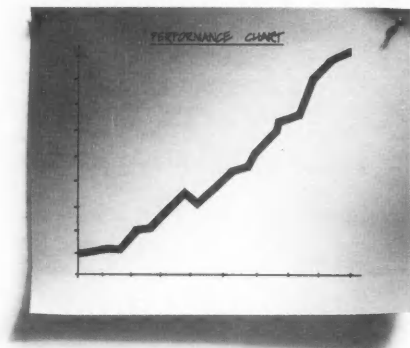
N'Route is a Windows utility that allows users to automatically route scanned images or incoming faxes on electronic mail.

All three Nestor products are shipping this month. OmniTools 1.0 and PC versions of NestorReader 2.0 sell for \$2,995; N'Route is priced at \$1,995.

Products like these will likely become more widespread. "Why key in data when it can be scanned and brought in automatically?" said Peg Hubner, a senior analyst designer at Connecticut Mutual. "Over the next five years we'll see manual data entry go away and be replaced" with OCR technology, she added.

Kleinberg agreed. "Almost everywhere you go — from the doctor's office to an insurance firm — there are pages and pages of paper forms which someone is rekeying into a machine," he said. "The market is huge."

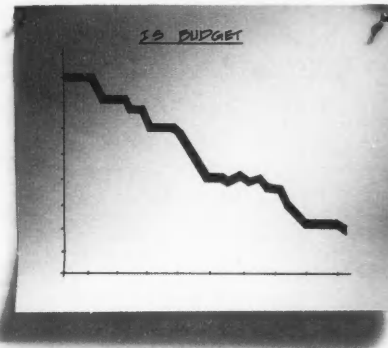
## Your Boss's Expectations



The executive committee has decided that your company's key to sustainable competitive advantage is a flexible information system — one that can speed up your processes and let you react quickly to change. Unfortunately, they've also decided to cut your budget.

Most likely, this leaves you with a mainframe system that can't fill the bill and an accounting department that won't take kindly to larger monthly bills.

## Your Budget



Of course, most members of today's executive committees have read an article or attended a seminar touting the wonders of economical mainframe alternatives and flexible client/server databases. So the answer probably seems simple — to them. But you've got to make it all work in the real world.

It's time to call in the team that knows how to do just that: Oracle and Hewlett-Packard. We've been developing products jointly for years — so you can be sure our systems work together for optimal performance and

## Application Development

### New Products

**Liant Software Corp.** has enhanced C++/Views Version 3.0, its object-oriented application framework for developing multiplatform graphical user interface applications using C++.

According to the Framingham, Mass., company, enhancements include support for Borland International, Inc.'s Borland C++ 4.0 and Symantec Corp.'s Symantec 6.1, in addition to Borland 3.1 and Microsoft Corp.'s C++ 7.0 and 8.0.

C++/Views also supports Dynamic Link Libraries with Borland C++ 3.1 and 4.0 and Microsoft C/C++ 8.0 compilers.

Prices range from \$749 to \$1,999.

► **Liant Software**  
(508) 872-8700

**Eagle Performance Software** has introduced SpeedPack II Version 7.20. The product provides Borland International, Inc. Pascal programmers with the tools necessary to increase the performance dedicated to 32-bit specific applications in DOS or Windows.

According to the Fort Worth, Texas, company, SpeedPack II offers a one-step Run-Time Library utility that lets programmers choose platforms with one button while using the Borland integrated drive electronics.

Version 7.20 provides a total of 82 new string routines; 21 string routines with multiple character find type that can locate any one of several characters in the same pass; 21 string routines with a subrange character find type that can include or exclude a subrange of characters in the same pass; and two string routines that can allow searches with wild cards.

SpeedPack II costs \$99.

► **Eagle Performance Software**  
(817) 735-4833

**MicroHelp, Inc.** has announced Version 4.0 of VB Tools, its Visual Programming custom-control tool kit.

According to the Marietta, Ga., company, this version includes 54 custom controls; a tab-and-tip control similar to those in Microsoft Corp.'s Word 6.0; 22 data-aware controls, including a virtual list box and combo box; and optional three-dimensional captions and borders.

VB Tools 4.0 costs \$129.

► **MicroHelp**  
(404) 516-0899

**Integrated Systems, Inc.** has introduced Embedded System (ES) profiler, a visual embedded application programming and debugging tool.

According to the Santa Clara, Calif., company, ES profiler software lets embedded application developers dynami-

cally view and diagnose faults in complex multitasking embedded applications, providing more intuitive problem-solving by eliminating the guesswork of text-based debugging methods.

Features include the ability to graphically display PSOS system component configurations, memory stack usage and errors, user-specified events, kernel object inventories and CPU use graphs.

Pricing begins at \$4,995.

► **Integrated Systems**  
(408) 980-1500

**AutoTester, Inc.** has announced that its software testing tool AutoTester for Windows 2.0 includes special drivers for testing client/server applications created with KnowledgeWare, Inc.'s ObjectView Desktop and Enterprise versions.

According to the Dallas company, AutoTester 2.0 includes word processing-type editing of tests, cut and paste, find/replace and adjustable fonts.

KnowledgeWare's ObjectView is a scalable, intuitive visual development environment designed to rapidly create high-performance client/server applications.

KnowledgeWare support is free with the product.

AutoTester for Windows costs \$5,000 per copy.

► **AutoTester**  
(214) 368-1196

**Trinzic Corp.** has introduced the Aion Development System (AionDS), an advanced development tool designed for building business process automation applications.

According to the Palo Alto, Calif., company, Version 6.4 provides users with a visual development environment for Windows or IBM OS/2 Presentation Manager applications using business rules and objects.

Version 6.4 of AionDS offers Microsoft Corp.'s Open Database Connectivity support and extended native database interfaces for commercial database management systems.

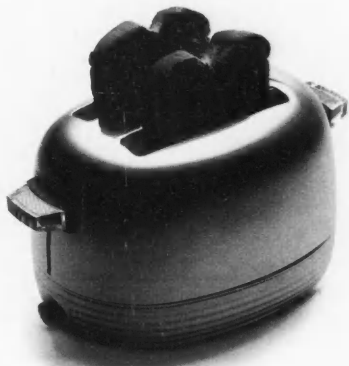
AionDS for Windows and OS/2 Presentation Manager costs \$9,000 per unit.

► **Trinzic**  
(415) 328-9595

### Product short

**Resource Solutions** and **PC-Cube Corp.** have introduced Casebase Version 4.0. PC-Cube's PC Guide to application development, maintenance, client/server and re-engineering products. Casebase compares more than 600 products from close to 250 vendors. The product can create a table that summarizes the features and capabilities of a set of products. Cost: \$195 for a year's subscription, \$295 for two years. Resource Solutions, Norcross, Ga. (404) 448-9836.

### Your Career



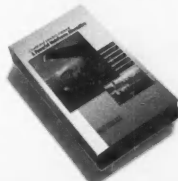
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reliability. We can even offer single point-of-contact for support once the system is up and running.

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Page 120



## POWER STRUGGLE

*Electric utilities face the shocking task of bridging a sleepy past and a high-tech tomorrow*

BY JOSEPH MAGLITTA



Like the airline, telephone and trucking industries before them, electric utilities are discovering that competition can be shocking. And that information technology can ease — or worsen — the pain.

Consider the recent experience of Pennsylvania Power & Light Co.

"Eighteen of our wholesale customers came to us and said 'What are you going to do for us?'" says Jack O. Beamer, project director at the \$2.7 billion utility. "Neighboring utilities had told them they would like to be their supplier."

So the Allentown-based utility assembled a bundle of 20 services, including meter testing, fleet maintenance and training courses for customers. It also lowered rates for the group.

But that's not all. In February, Pennsylvania Power embarked on a project to re-engineer all of its major business processes. Eventually, the utility plans to replace its IBM 3090-based information systems infrastructure and shift to Unix and client/server systems.

"We have three main areas of concern today: competition, customers and change," Beamer explains.

### Counting on new technology

After a century of sleepy, quasi-public monopoly, electric utilities are scrambling to survive in the strange new world of regulated competition.

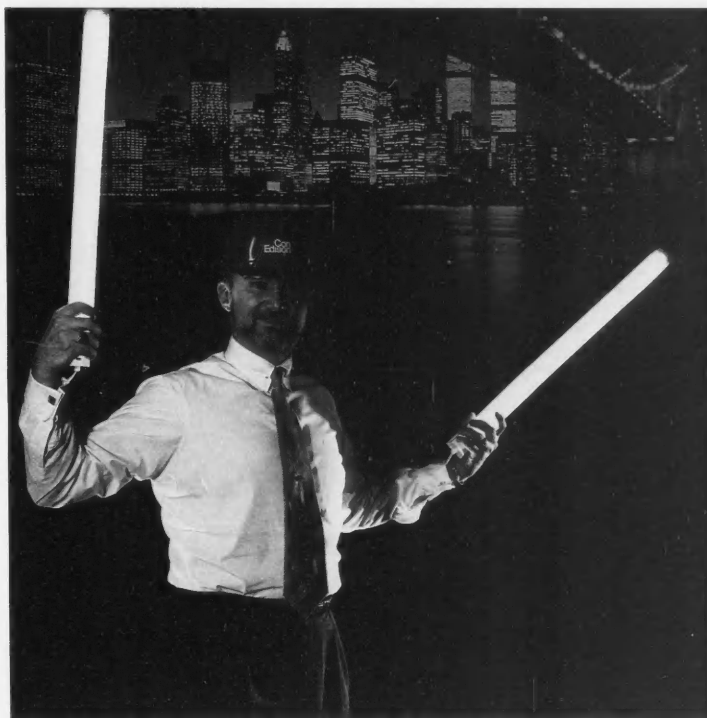
And this — the last major U.S. industry to be deregulated — is counting on re-engineering, client/server computing, voice technology, sophisticated mapping systems, high-speed fiber-optic networks and other modern technologies to make it happen.

"We're used to thinking of utility stocks as the finest for widows and orphans," says Arthur A. Thompson, a University of Alabama professor and utility industry expert. "But this is an industry changing as fast as any in the world."

Pressures from environmentalists opposed to new power plants and unhappy investors are big factors. So is the National Energy Protection Act of 1992. It forced utilities to become 30% more efficient by 1997 and encouraged competition by letting "outsiders" sell power using existing utility grids.

Moreover, state and federal pressures to lower prices continue to grow. Big business is also putting on the heat.

"The General Motors of the world are pushing hard to get lower price-



Consolidated Edison's Ed Glistler: \$24 million call center automation helps keep the lights burning cheaply. Solid infrastructure is the key to growth and survival, he says.

es," says Clinton J. Andrews, a Princeton University assistant professor, consultant and expert on electric planning and regulation.

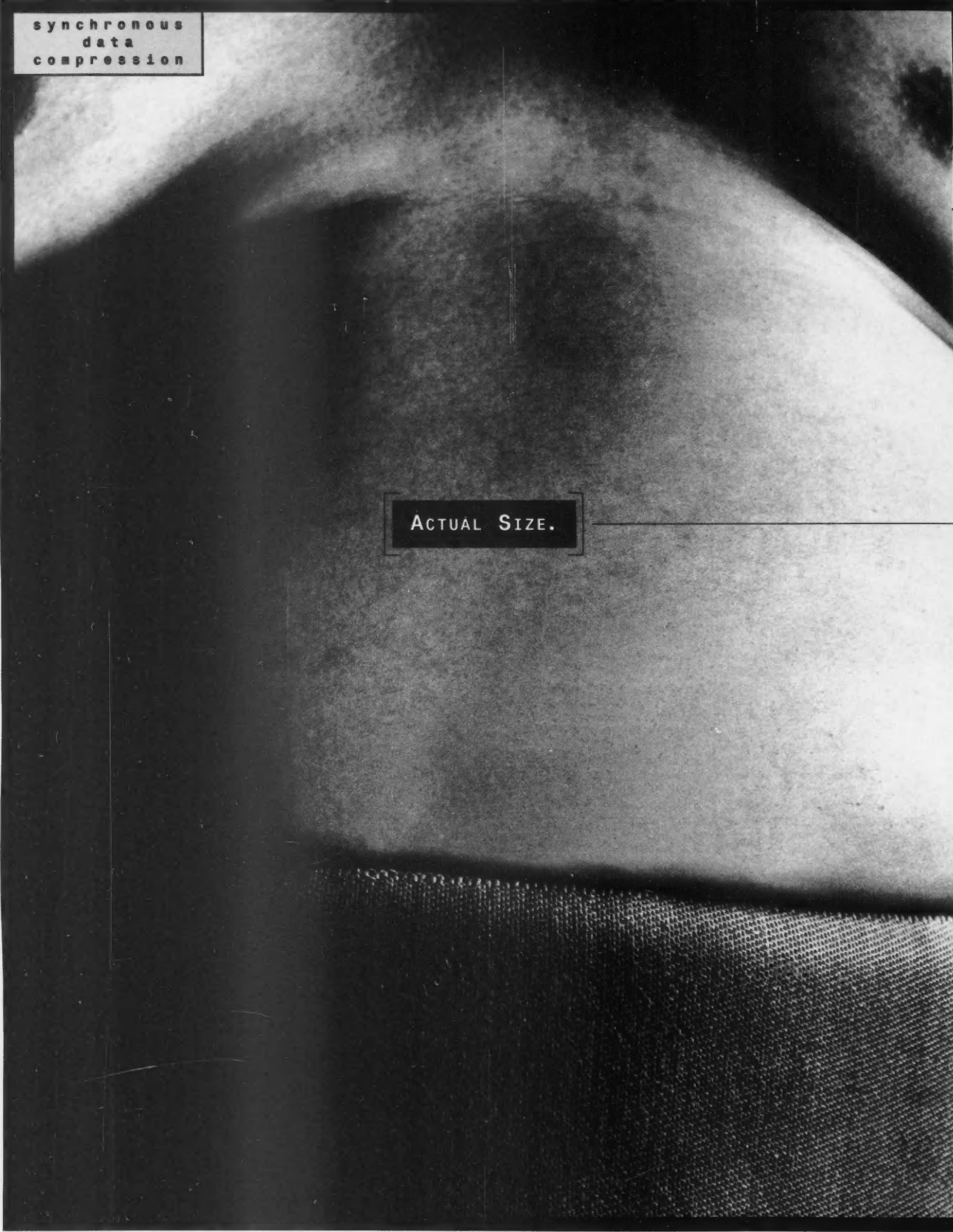
As a result, electric utilities now face legions of new foes, including gas companies, independent producers, alternative energy providers using wind or solar power, industrial co-generators and, of course, one another.

Overseas suppliers also are eager to generate power on U.S. shores. The first effort, a \$1 billion power plant in Georgia, was recently opened by Southern Electric PLC, a British firm.

Although experts say widespread industrial and retail competition is at least several years away, electric companies aren't waiting to get

Power struggle, page 84

**INSIDE:**  
Upcoming  
conferences  
and events  
Page 87



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## CASE STUDY

### Carolina Power & Light Company

**PROJECT:**  
Customer information management.

**GOAL:**  
To improve customer information and efficiency, reduce costs.

**OLD WAY:**  
Lots of manual operations; 1,500 users on 20-year-old IBM mainframe. More than 250 subprocesses.

**NEW WAY:**  
Everything handled on-line, including bill image details, real-time payment posting, on-line scheduling and to-do lists. Marketing reps, engineers and dispatchers use system. Customer service and accounting now automated.

**TIME FRAME:**  
Planning mid-1988; on-line rollout began in January 1993.

**STAFFING:**  
200 people in Customer and Operating Services, led by Information Services.

**COST:**  
\$44 million.

**BENEFITS:**  
27% force reduction in customer information systems, about 100 people. Information now accessed in seconds, not minutes. Detailed analysis available before end of month.

**NEAT:**  
Most complex system ever tackled by Carolina Power. First known use of large-scale offshore programming in utility industry. One of first utilities to use activity-based costing.

**HEADACHE:**  
Need to create 26 different screens.

**LATEST PHASE:**  
Budgeting and management modules, December 1993.

**NEXT STEP:**  
To finish rollout to last customer service division by June.

**TIP:**  
To eliminate duplicated effort, send a tools diskette to each office that contains step-by-step procedures, flowcharts, job descriptions, memos to office staff.

## Power struggle

CONTINUED FROM PAGE 81

zapped. They are furiously economizing, downsizing and building applications that will help them attract and keep customers.

"Electric utilities used to say, 'We don't care about costs.' Suddenly they do," says Richard MacAlmon, vice president of marketing at The Indus Group, Inc. The San Francisco-based firm last month began a re-engineering consultancy aimed at utilities.

### Making improvements

A recent survey by CSC Index, Inc. illustrates a high interest in the competitive use of technology. A whopping 90% of the chief information officers in the utility industry polled said their organizations would make major IS investments aimed at improving customer service this year. Some 62% are tackling some form of re-engineering, the survey found.

Pennsylvania Power took the plunge after completing an IS strategy plan last August. After issuing a request for proposals last November, it chose Waltham, Mass.-based CSC Consulting from a field of 14 vendors. The first phase of the project, worth \$3.5 million, will create a business case and design the IS architecture.

Beamer says the new client/server-based system will eventually include modules for customer information, automatic mapping, facilities management, marketing intelligence and more.

"Customers want to talk with one person who can solve their problems," notes Robert Welch, vice president at CSC Consulting. "They don't want to talk with one person to turn the power off, another if their bill is incorrect."

What impact new services will have on IS managers at companies that buy electricity is not certain. Analysts agree that competition promises to lower prices and increase pricing options, especially in high-cost states such as California, New York and Massachusetts.

"On Long Island, a kilowatt hour costs 16 cents. In Florida, it's 7 cents," notes Michael Weiner, vice president of the utilities practice at CSC Index. "That gap is going to close."

But the shift to a buyer's market also promises to create unprecedented challenges for utility IS departments. While individual plans will differ, information technology lies at the core of most scenarios.

Many electric companies, for instance, are exploring technology-based services including automatic meter reading, remote account activation and remote maintenance.

Longer term, many utilities are hoping to exploit existing

rights-of-way and fiber-optic transmission lines. Though tight-lipped, many utilities are also exploring ways to go "beyond" the meter and enter areas beyond their traditional generation and distribution businesses.

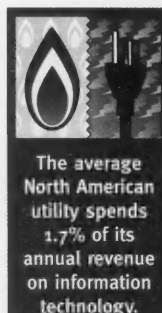
"Companies now have to think beyond the meter," Weiner says.

Among the possibilities: telephone and fax services, cable television, mass electronic publishing, home security systems and electronic funds transfers.

Even the biggest boosters, however, acknowledge that most such visions are several years and many millions—possibly billions—of dollars away. "Simply keeping track of who's going to pay for what is a major technology effort," Andrews notes.

In the meantime, most utilities face the Herculean technological task of bridging a sleepy past and a high-tech tomorrow. For many, it won't be easy.

"The utility industry for a long time was behind the technology curve," says Joseph E.



The average North American utility spends 1.7% of its annual revenue on information technology.

Source: CSC Index, Inc., Cambridge, Mass.

### POWER PLANNING



recent poll of top-ranking utility executives illustrated heavy interest in flexible, customer-focused technologies

#### TOP TECHNOLOGIES

- 1 Client/server
- 2 LANs, wide-area networks
- 3 Geographic information systems

#### ISSUES

- 1 Aligning IS and corporate goals
- 2 Organizing and using data
- 3 Improving IS human resources
- 4 Re-engineering processes with IS
- 5 Creating an IS architecture

#### TOP INVESTMENT AREAS

- 90% Customer service
- 55% Systems development/IS
- 52% Purchasing/Sourcing
- 47% Accounting/Billing/Finance
- 38% Marketing/Market research

Source: CSC Index 1994 annual survey of North American IS executives

Hunter, manager of information systems at Baltimore Gas & Electric Co. in Baltimore, Md.

While many power companies have done a creditable, sometimes admirable, job in automating the power generation side of the business, business functions are another story.

### Outdated systems

Analysts say the typical medium or large utility in the U.S. has poorly integrated, out-of-date systems installed in the late 1960s or early 1970s. Some may have up to a half-dozen unconnected billing systems or computer-aided design workstations not linked to downstream systems.

Flexibility is a big headache.

"Our customer information system is a 25-year-old IBM

### CUSTOMER TECH

#### Accepted



he fast-changing world of customer contact in electric utilities runs the continuum from automatic call distribution to leading-edge approaches such as customer self-service

- Automatic call distribution
- Multiple access paths to account information
- Electronic bulletin boards
- Multilingual customer contact

- 24-hour operation
- Centralized phone center
- Automated customer service representative scheduling
- Telephone response units for routine customer inquiries
- More detailed customer information
- Monitor contact quality
- Single companywide phone number
- Conferencing

#### Emerging

- Automatic caller ID
- Direct customer access to information
- Automatic data transfer
- Telephone response units to capture customer information
- Access to incremental usage data
- One-stop connect/disconnect for multiple utilities
- Customer self-service
- TV tellers

Source: Andersen Consulting, Chicago



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 70. Communications Systems/Public Utilities/  
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 80. Mining/Construction/Petroleum/Refining/Agric.  
 90. Manufacturer of Computers, Computer-  
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 IS/MIS/DP Management  
 21. Dir./Mgr. MIS Services, Information Center  
 22. Dir./Mgr.: Network Sys., Data/Tele. Comm.,  
 LAN Mgr./PC Mgr., Tech. Planning, Admin. Svs.  
 23. Dir./Mgr. Sys. Development, Sys. Architecture  
 31. Programming Management, Software Developers  
 41. Engineering, Scientific, R&D, Tech. Mgt.  
 60. Sys. Integrators/VARs/Consulting Mgt.  
**CORPORATE MANAGEMENT**  
 11. President, Owner/Partner, General Mgr.  
 12. Vice President, Asst. VP  
 13. Treasurer, Controller, Financial Officer

- DEPARTMENTAL MANAGEMENT**  
 51. Sales & Mktg. Management  
 70. Medical, Legal, Accounting Mgt.  
**OTHER PROFESSIONAL MANAGEMENT**  
 80. Educator, Journalists, Librarians, Students  
 90. Other Titled Personnel

- 3. Do you use, evaluate, specify, recommend, purchase:**  
 (Circle all that apply)  
**Operating Systems**  
 (a) Solaris (e) Mac OS  
 (b) Netware (f) Windows NT  
 (c) OS/2 (g) Windows  
 (d) Unix (h) NaXTstep  
**App. Development Products** ☐ Yes ☐ No  
**Networking Products** ☐ Yes ☐ No

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 60. Government - State/Federal/Local  
 70. Communications Systems/Public Utilities/  
 Transportation  
 80. Mining/Construction/Petroleum/Refining/Agric.  
 90. Manufacturer of Computers, Computer-  
 Related Systems or Peripherals  
 95. Systems Integrators, VARs, Computer Service  
 Bureaus, Software Planning & Consulting Services  
 96. Computer/Peripheral Dealer/Dist./Retailer  
 99. Other \_\_\_\_\_  
 (Please Specify)

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**IS/MIS/DP MANAGEMENT**  
 19. Chief Information Officer/Vice President/ Asst. VP  
 IS/MIS/DP Management  
 21. Dir./Mgr. MIS Services, Information Center  
 22. Dir./Mgr.: Network Sys., Data/Tele. Comm.,  
 LAN Mgr./PC Mgr., Tech. Planning, Admin. Svs.  
 23. Dir./Mgr. Sys. Development, Sys. Architecture  
 31. Programming Management, Software Developers  
 41. Engineering, Scientific, R&D, Tech. Mgt.  
 60. Sys. Integrators/VARs/Consulting Mgt.  
**CORPORATE MANAGEMENT**  
 11. President, Owner/Partner, General Mgr.  
 12. Vice President, Asst. VP  
 13. Treasurer, Controller, Financial Officer

- DEPARTMENTAL MANAGEMENT**  
 51. Sales & Mktg. Management  
 70. Medical, Legal, Accounting Mgt.  
**OTHER PROFESSIONAL MANAGEMENT**  
 80. Educator, Journalists, Librarians, Students  
 90. Other Titled Personnel

- 3. Do you use, evaluate, specify, recommend, purchase:**  
 (Circle all that apply)  
**Operating Systems**  
 (a) Solaris (e) Mac OS  
 (b) Netware (f) Windows NT  
 (c) OS/2 (g) Windows  
 (d) Unix (h) NaXTstep  
**App. Development Products** ☐ Yes ☐ No  
**Networking Products** ☐ Yes ☐ No

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## COMMUNICATIONS POWER



How Carolina Power communicates information about re-engineering and IS



Source: Ernst & Young, Boston

### COMMUNICATION

### AUDIENCE AND PURPOSE

#### Customer satisfaction survey index

- A composite index of nine individual surveys to monitor customer satisfaction with each service area. Score is calculated and monitored annually and shared with Carolina Power management.

#### Employee opinion survey

- Internal Information Systems Division (ISD) survey to determine whether employees have resources and structures necessary to perform their work. Results communicated through meetings within department.

#### Newsletters

- Monthly internal ISD newsletter communicates about major projects and other news within ISD.
- Quarterly newsletter to Top 600 employees within Carolina Power to provide updates on new projects and technologies.

#### Memos and articles

- ISD circulates relevant articles to managers and other internal groups on an ad hoc basis.

#### Published documents

- Key ISD documents, such as the Information Technology Architecture and the End-user Computing Products Catalog, are distributed and updated to the appropriate individuals within Carolina Power.

mainframe," says Beamer at Pennsylvania Power. "It does not have the capability to react as we need to react today."

One shocking example: The utility recently switched from mercury vapor street lights to sodium vapor, which required altering one parameter on the mainframe system.

"It took 1,100 programming hours to make that change," Beamer says.

### Infrastructure first

According to a recent CSC Consulting study, the average utility spends only about 1.7% of its revenue on information technology, compared with the more than 5% that financial services firms spend. That appears to be changing quickly, however.

Many utilities are investing heavily in modernizing their networks and communications. Northeast Utilities, Florida Power Corp. and Consolidated Edison of New York, Inc. are among the dozens of utilities now aggressively building up infrastructures.

"Even the best visionaries have difficulty thinking about how to evolve," says Ed Glistner, re-engineering project director at Con Edison. By building a framework for future growth, Glistner explains, utilities can prepare for future business—whatever it may be.

"If you provide a technology foundation to do business things better, you may not think of everything," Glistner says. "But you are enabling the company for the future."

Con Edison is completing a massive re-engineering of its infrastructure and service operations for its 3 million customers in metropolitan New York.

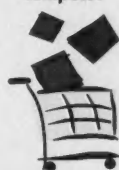
Entergy, the nation's fifth largest utility, says it has tripled its number of LANs since 1992. "Our goal is to make information technology the hub around which Entergy rotates," says Dennis Walsh, vice president and chief information officer at the \$6 billion New Orleans-based company.

Carolina Power & Light Co. has a new philosophy, says R. Thomas Dwyer, vice president of information services: "Unless it is saving us money, we are not going to do it."

Still, the Raleigh, N.C.-based supplier is a good example of a utility keen on deploying carefully chosen information technology.

Carolina Power recently completed a large re-engineering program aimed at improving service to its 1 million customers (see chart). The \$2.9 billion utility also reorganized its IS department, creating a corporate re-engineer-

### How do electric utilities compete?



The notion of shopping for the cheapest electric power may seem strange. Don't feel bad; utilities feel the same way.

#### Here's how it works:

- The National Energy Protection Act, passed in October 1992, lets independent producers sell electricity to wholesale customers through existing utility transmission lines. "Outsiders" can also bid to build new power plants.
- Use of this "outside" power rose 15% last year. But transmission and distribution remain a utility monopoly—for now.
- However, within a couple of years, independent providers may be able to bypass utilities altogether and sell directly to industrial and retail customers.
- If so, the electricity industry could be relegated to the role of buying power from the cheapest sources and transmitting it over the existing grid.
- Many changes are regional and not uniform. Forms and levels of competition that will emerge are still unclear, experts caution.

ing consultancy.

And late last month Carolina Power and Andersen Consulting rolled out what was hailed as one of the nation's first energy management systems based on client/server technology. The system provides real-time monitoring of 16 generating plants and a high-voltage transmission network spanning two states, according to the firms.

### Too little, too late?

Despite all the action, some worry that things are moving too slowly—or too fast. Weiner warns that many process redesign efforts are too limited. "It is going to require radical changes in business process, not incremental changes, to be a survivor," he says. Weiner predicts that no more than 50 utilities—and perhaps as few as five—will survive until the end of the decade.

Others worry about the high failure rate of many electric company technology initiatives.

One high-level IS executive points to "at least four or five" medium-size utilities that have spent \$30 million to \$40 million each in failed customer service projects. One debacle cost a CIO his job after only 16 months.

"I've spent a lot of sleepless nights," the executive says. "These projects are real hard."

While some utilities struggle to keep staff interested in maintaining mainframe systems, many electric companies are "enraptured with emerging technologies that are not too stable." He warns that many are going "too far, too fast."

### Facing formidable foes

Others share the concern. "Long on promise and short on practicality" is how Michael Ashworth characterizes grand electric company schemes for becoming big fiber-optics players or providers on the national information infrastructure.

Ashworth, vice president of customer enterprise systems at Energy Management Associates, the Atlanta-based utilities division of Electronic Data Systems Corp., says utilities "better focus on getting the existing information technology house in order."

"Few, if any, electric utilities have information systems that are prepared for the onslaught of data and complex systems integration requirements associated with the info-way," Ashworth writes in *Fortnightly*, a utility industry magazine. "Most companies

Power struggle, page 86

## CASE STUDY

### Consolidated Edison of New York, Inc.

#### PROJECT:

New customer service system.

#### GOAL:

To reduce 4 million annual letters, make it easier to do business with company, empower 1,000 customer service reps at 20 sites, improve information.

#### OLD WAY:

Reps used up to a dozen 3270 terminal screens on 1972 centralized IBM CICS system. Lots of paper, phone calls, redundant data entry.

#### NEW WAY:

Client/server. Users can point and click on single screen, use DB2 and SQL. Phone and data integrated. Integrated PC subsystems handle workflow management, user contact, ad hoc database query, automated cash processing, voice/data integration. New T-1 nets at 20 sites.

#### TIME FRAME:

Study 1989-90; rollout November 1992 to present.

#### STAFFING:

15 full-time IS people.

#### COST:

\$25 million.

#### BENEFITS:

\$5 million annual savings, including \$2 million for eliminating 100 clerical positions. Service improved on 20% of phone calls; length reduced by 125 seconds per call. 2 million customer visits eliminated per year.

#### NEAT:

Some 400 interviews with customer reps and management ensure right system gets built.

#### HEADACHE:

Memory management problems in Windows caused server crashes.

#### LATEST PHASE:

Another 350 workstations rolled out April 18.

#### NEXT STEP:

To redesign core IBM customer system.

#### TIP:

Forget formal specs. Take initial cut of screens and processes. Start iterative development.

## CASE STUDY

### Baltimore Gas & Electric Company

**PROJECT:**  
Mobile data terminal system.

**GOAL:**  
To improve dispatching and performance of 250 mobile service vans.

**OLD WAY:**  
Service techs got paper work orders each morning. Technicians would radio back a three- to five-minute call. Many missed calls, other applications slowed.

**NEW WAY:**  
Customer call goes to IBM 3090-500, then to new customer information system using DB2. CICS link to Tandem TLX computer. Real-time work orders routed to technician using Motorola, Inc. mobile terminal and resource management system.

**TIME FRAME:**  
Started in 1990, implementation began in December 1992.

**STAFFING:**  
16 (peak) from Information Systems, Gas & Appliance Service and Telecommunications Divisions. 6,700 IS hours, 16,100 customer hours.

**COST:**  
\$3.4 million.

**BENEFITS:**  
Dispatch time reduced from five minutes to 10 seconds. Personnel savings of \$1.5 million a year.

**HEADACHE:**  
Dispatch technicians need time to get comfortable with new system.

**LATEST PHASE:**  
Service history of last five service calls added in March 1994. Training of 300 technicians continues.

**NEXT STEP:**  
To create separate repair subsidiary, look at whole house maintenance.

**TIP:**  
"Don't wait to pick a vendor or a product." Austina M. Ivashyn, systems project administrator.

## Power struggle

CONTINUED FROM PAGE 85

have not even completed re-engineering and redeveloping their customer enterprise systems."

George M. Hill, a worldwide partner of Andersen Consulting's energy practice, disagrees. "It won't happen overnight," he says. "But it will happen sooner than

you think."

Others note that Duke Power Co., Entergy and The Tennessee Valley Authority are already experimenting with real-time pricing. That means prices could be adjusted almost continuously, for example, reflecting higher or lower costs for different usage periods.

Pacific Networks, Inc. and Entergy are also testing a fiber-optic-based link that they say would permit more efficient power generation and distribution to 50

homes in the state of Arkansas.

Within the industry, consensus is mixed about how quickly utilities should proceed in developing the next generation of technology-based utility services.

For now, IS executives at U.S. utilities find themselves in a hurry-up-and-wait game. But, warns Weiner, "we are running out of time."

Maglitta is *Computerworld's* senior editor, corporate strategies.

**W**hen a few engineers at Microsoft set out to write Windows NT, they sat down with many cups of coffee, and computers built around the MIPS® R4400® RISC microprocessor.

(No wonder: the NEC V<sub>R</sub>4400® MIPS processor is at the heart of some of the most powerful computers in the world.)

During the next few years, they worked long and hard, missing quite a few dinners with their families and untold televised sporting events.

Today, Windows NT makes it possible for companies to run their enterprise software on a whole new class of dependable, affordable machines. Like the NEC Express RISCserver™, direct descendant of the machines used to write NT itself.

And it gives software developers, designers and engineers access to remarkable new tools like the NEC Image® RISCstation™.

In short, a few engineers sat down. And the entire computing world leaped.

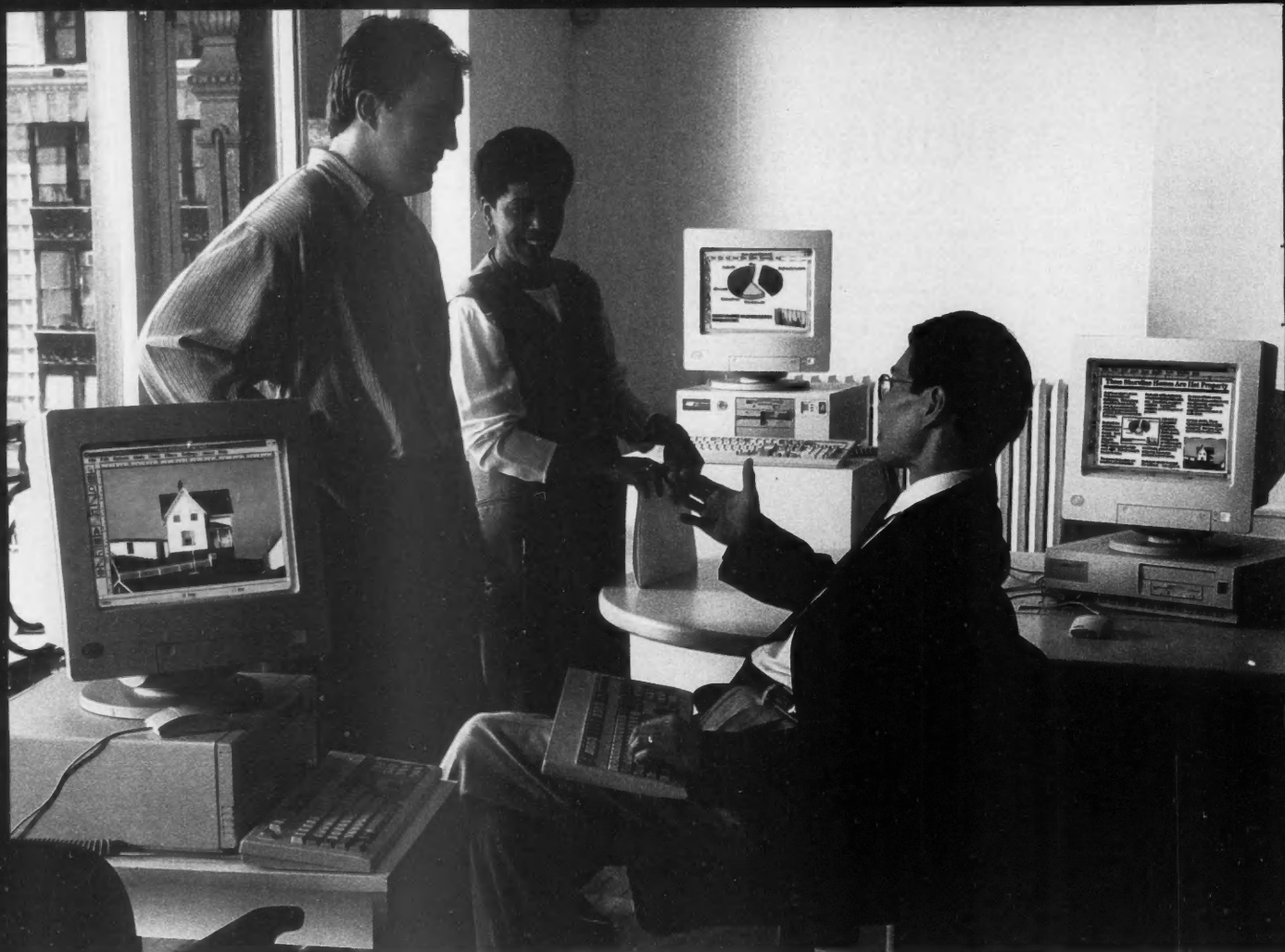
- The only Windows NT-specific systems in the industry. NEC MIPS RISC Systems
- Express RISCserver
- Image RISCstation for the new generation of 32-bit client/server and database applications
- NEC V<sub>R</sub>4400® MIPS RISC processors with MultiRISC™ architecture supporting dual processor SMP operation
- MultiRISC system management for hardware problem detection and reporting (standard on RISCserver)
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- Hard drive options up to 2 GB
- Fault-tolerant "hot swap" RAID option (RISCserver)
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A river of coffee. A raft

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## COMPUTERWORLD MAY 9, 1994 87



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**BYTE**  
January, 1994

**COMPUTER  
SHOPPER**  
November, 1993

*"The 17P was the clear winner for image quality in its class."*

*"The IBM 15P...ranking among the best 15-inch monitors for ease of operation, color control, video mode support...."*

*"The IBM 17P will turn heads for its bright colors and crisp text...the price is right, too."*

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**PCComputing**  
December, 1993

**PC  
MAGAZINE**

December 7, 1993

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# The CW Guide to Mobile Computing

# Hitting <sup>the</sup>

New products help  
IS outfit workers for  
remote computing,  
but support issues  
remain unsolved



Unlike some areas where technology is in search of a user need, mobile computing is a user need in search of technology.

For information systems organizations there are myriad problems with equipping large groups of users with notebooks, communications links and applications, not the least of which is fitting the right system configuration to the right worker.

In this report, **mobile guru Andrew Seybold** states the facts of this and other issues, such as security worries from uncontrollable mobile systems and reliability concerns with communications technologies. His conclusion? There aren't any good solutions yet, but vendors and IS managers are working on it.

In the meantime, users can expect limited access to corporate networks and continued battles with the help desk over their nonstandard software. On the bright side, new technologies in battery design and storage will give notebook users more mileage and capability than ever before.

Also, the leading color notebooks from **Apple Computer, Inc.**, **Compaq Computer Corp.**, **IBM** and **Toshiba America Information Systems, Inc.** received high user satisfaction ratings, particularly in reliability, in our 190-user Buyers' Satisfaction Scorecard survey. **Compaq's new Contura Aero** also received a favorable nod in our Firing Line evaluation.



# Payoffs and pitfalls await unwary warriors

IS has a key role to play in prepping and managing mobile computing

Hitting the road with computing power isn't as easy as picking up a standard notebook and hopping into the car. Information systems managers must lay the foundation for mobile workers by carefully evaluating power requirements and establishing communications links and procedures.

The good news is that although advanced services such as two-way wireless file transfer are still immature, today's technology is strong enough to provide solid payback when implemented thoughtfully.

Here is a truth that sounds obvious but is often overlooked: **If IS gives all mobile workers the same set of tools, some will be short-changed and others will be overequipped.**

IS managers should take a leading role in matching the field hardware and communications services to the needs of the people who will use it.

A large sales force might be outfitted with color portable computers because salespeople use them for customer presentations. Their communications needs might be met with a built-in landline modem that provides access to their electronic mail and other corporate re-

sources when they are near a phone. They could also be equipped with a messaging wireless receiver so price changes, inventory updates and other important information can be transmitted to them individually, in groups or companywide.

Compare that scenario with a service organization that might need smaller monochrome systems equipped with full two-way wireless connectivity. They could receive their next service call, order parts and access a corporate database for troubleshooting. These systems should be tailored to the job and the amount of communications required. Systems that appear to work best in this case are those with specific menu-driven commands that do not require the user to be computer-literate.

Traveling executives or groups of management personnel will have still another set of requirements. The first question is whether this group needs to create work while mobile or needs only to access work completed by others for review and comment. Another consideration when selecting the proper platform for this group is the need to equip assistants who carry out the group's instructions.

The answers will determine the equipment needed. If a user does have an assistant, provide the assistant with a desktop computer link

to the traveling executive. One of the most productive combinations is for the assistant to key in voice messages and send them to the executive's system. If the executive also carries a pager, a page can be sent to indicate that messages are waiting.

Portable computers today run the gamut from handheld units such as Hewlett-Packard Co.'s HP 100LX (with miniature keyboard) and personal digital assistant devices such as Apple Computer, Inc.'s Newton MessagePad (pen input only) to subnotebooks, notebooks and full-size laptops.

Employees who truly need to carry a complete duplicate of their desktop system will require a 5- to 6-pound color notebook computer with a large hard disk and a built-in wired modem. The configuration of this unit, however, should include a second battery (battery life is generally about two to four hours per charge) and the battery charger. **A 6-pound notebook will translate into a mobile weight of about 10 pounds with the spare battery, charger and cables.**

Expect the initial system to cost between \$2,000 and \$4,000, depending on the options and manufacturer. If you choose wireless two-way modems, add another \$300 to \$700, plus a

## Photo finish

Leading notebooks fare well in user satisfaction survey



The notebook computer is still the staple of corporate mobile computing, and users surveyed for the Buyers' Satisfaction Scorecard indicated that the color notebook market is a tough place for vendors to distance themselves from the pack.

Overall, the four market-leading products in the survey finished within a few points of one another. Compaq Computer Corp.'s LTE 433C edged out IBM's ThinkPad 750C and Toshiba America Information Systems, Inc.'s T4700 by the narrowest of margins for highest user satisfaction.

Apple Computer, Inc.'s PowerBook 180C was not far behind, although it has

fallen from the dominant position it earned in a 1993 survey of monochrome models.

Nowhere was the products' parity more evident than in the area of service and support, where PowerBook eked out a slight advantage in user satisfaction. Perhaps the equality of the service and support offerings accounted for the surprisingly low importance rating users assigned to this normally critical category. Some systems vendors are even betting their entire portable computer marketing strategy on distinguishing their service and support [CW, April 11]. Service and support ranked ninth in importance out of 15 items.

Users of Compaq's product were pleased with the LTE 433C's portability and durability, which were calculated as the mean score of several subcategories. (The portability rating in the accompanying chart incorporates scores in battery life, size and weight, for example.)

The trade-off with LTE 433C is in display quality. Though it offers active-

matrix color, it finished with lower marks than other products in screen readability and quality of color display.

Remarkably, the LTE Lite product line is 2 years old. In early March, Compaq announced a LTE Elite line that tops out with the 450CX model. The company also offers lower-end color models in its Contura line.

Users said IBM's ThinkPad 750C was notable for its keyboard and its integrated pointing device, a small joystick fixed in the middle of the keys. They also scored the ThinkPad high in expansion capability. The product earned the lowest satisfaction scores of the group only in application compatibility.

Toshiba's T4700 was in some respects the reverse of Compaq's notebook. It earned exceptional scores in display quality but fared less well in the durability of its construction. Users liked the product's networking and communications capabilities, awarding it the highest score in that category.

PowerBook's overall score was competitive, although like LTE 433C, it is an aging model. PowerBook's biggest weakness appeared to be its battery life, where it scored substantially lower satisfaction ratings than the other products. It matched Compaq for the highest satisfaction score in application compatibility.

### IMPORTANCE RATINGS

#### Reliability

|     |                           |
|-----|---------------------------|
| 8.5 | OVERALL RELIABILITY       |
| 8.5 | APPLICATION COMPATIBILITY |
| 8.1 | RUGGEDNESS AND DURABILITY |

#### Ease of use

|     |                           |
|-----|---------------------------|
| 8.3 | SCREEN READABILITY        |
| 8.0 | QUALITY OF COLOR DISPLAY  |
| 7.4 | KEYBOARD                  |
| 7.2 | MOUSE/POINTING DEVICE     |
| 7.1 | CONNECTIVITY CAPABILITIES |

#### Performance

|     |                        |
|-----|------------------------|
| 7.8 | PROCESSING PERFORMANCE |
| 7.5 | HARD DISK PERFORMANCE  |
| 6.9 | EXPANSION CAPABILITIES |

#### Portability

|     |                 |
|-----|-----------------|
| 7.5 | BATTERY LIFE    |
| 7.2 | SIZE AND WEIGHT |

#### Service and support

|     |                      |
|-----|----------------------|
| 7.5 |                      |
| 7.5 | VALUE FOR THE DOLLAR |



## Andrew Seybold's traveling gear

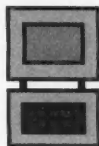
It takes a lot to be "mobile" these days

1

**HARDWARE**  
Hewlett-Packard OmniBook 425 with built-in modem

**SOFTWARE:**

- Connect Software's E-Mail Connection for MCI Mail and CompuServe access
- Traveling Software's CommWorks

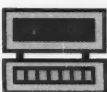


2

**HARDWARE**  
HP 100LX handheld computer (used as two-way E-mail system)

**SOFTWARE:**

- Ericsson GE's Mobidem connected to RAM Mobile Data's RadioMail E-mail software



3

**HARDWARE**  
Motorola MicroTac Lite portable cellular phone



4

**SkyTel SkyWord pager with alphanumeric display**  
**ACCESS VIA:**

- 800 number dial-in service
- Desktop computer using WinBeep software
- Internet through RadioMail



- I can also use the Mobidem on the OmniBook 425; on extended trips, I use that combination and leave the HP 100LX at home.
- I use the ECCO personal information manager software package on my network. When I leave for a trip, I download the phone book and calendar to both the 100LX and the OmniBook using IntelliLink for Windows.

monthly service charge of \$50 to \$150. Those rates can be reduced if you deal with enough wireless users to purchase airtime in bulk.

Those who need to do only light creation work but who must access work done by others for review and comment will succeed with a subnotebook that has a monochrome or passive color screen (such as Gateway 2000, Inc.'s Handbook or HP's OmniBook).

This type of system is lighter, with a total carrying weight of about 6 pounds. Battery life is longer, and the unit can be carried more easily in a briefcase. Unfortunately, subnotebooks are not all that much cheaper than full-fledged notebooks, particularly when the wired modem is not built in and tacks on another \$299 or so to the bill.

Built-in modem/fax modules are recommended, if available. You may also simply use a PCMCIA Type II or Type III slot designed for external communications devices. Both notebooks and subnotebooks generally offer this option.

Currently, it is possible to buy a PCMCIA card fax/modem send-receive card and a wireless messaging receiver (pager) card. Soon you will also be able to buy a two-way wireless data modem that will provide wireless access back to your corporate computing system using RAM Mobile Data, ARDIS or analog cellular systems. Additional networks will come on-line as soon as 1995. Subnotebooks cost roughly the same as notebooks.

When you buy a portable computer, make sure it has at least one PCMCIA Type II slot. In the larger portables (full-size notebooks), buy a system with a Type III slot that will accept either a single Type III card (11mm thick) or two Type II cards (each 5mm thick) so you can protect your investment. As more wireless services and PCMCIA card wireless modems become available, you will have the option of

adding services. Be prepared, though, to bite the bullet on price: **PCMCIA communications cards can cost almost twice as much as a similar device not built into an integrated circuit card format.**

Handheld systems such as the HP 100LX are usually appropriate if the user is interested only in access to corporate E-mail systems or public E-mail services such as MCI Communications Corp.'s MCI Mail or AT&T Corp.'s EasyLink. A palmtop, coupled with a wireless modem and packaged in a travel case, takes up about the same room as a 5- by 7-in. daybook. While the keyboard is not a standard size, it is more than adequate for E-mail activities, and users become accustomed to it in short order.

Managing the communications links between the portables and the company's computing resources can be a chore. Installing even a simple modem can open up a whole can of worms in terms of security and data integrity.

Typically, those who use portable computers to augment a desktop PC will ask for and receive a direct-dial modem line on their desks. When in the office, users will use this phone link to access external information services and public E-mail systems. Traveling users will soon find that by installing remote control software such as Symantec Corp.'s PCAnywhere or Microcom, Inc.'s Carbon Copy on their desktop PC, they can access their own system and all connected LAN services. In this case, the portable computer becomes a remote terminal to the desktop system.

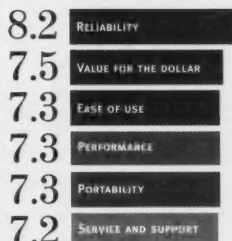
The downside is that the phone line and modem become another point of access to your network. No matter how secure your main access points are, **if users have dial-up modem connections to individual desktops, the system is only**

Payoffs and pitfalls, page 94

### COMPAQ LTE 433C

**TOTAL  
SCORE 75**

RESPONSE BASE: 50 USERS



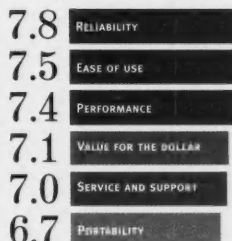
RATINGS ARE BASED ON A 1-TO-10 SCALE, WHERE 10 IS BEST.

Compaq's entry stood out in size, weight and battery life, yielding it the highest portability satisfaction ratings of the four products surveyed. The LTE also earned high marks for its rugged construction.

### IBM ThinkPad 750C

**TOTAL  
SCORE 74**

RESPONSE BASE: 50 USERS



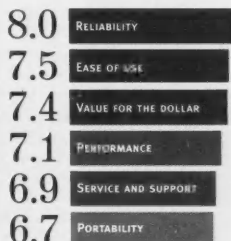
RATINGS ARE BASED ON A 1-TO-10 SCALE, WHERE 10 IS BEST.

Users particularly approved of the ThinkPad's joystick-like pointing device and keyboard. Its overall performance score was boosted by strong hard-disk performance ratings. In most other areas, the ThinkPad rated in the middle of the pack.

### TOSHIBA T4700

**TOTAL  
SCORE 74**

RESPONSE BASE: 30 USERS



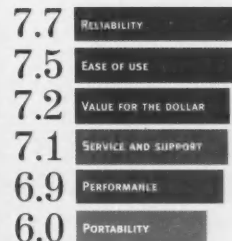
RATINGS ARE BASED ON A 1-TO-10 SCALE, WHERE 10 IS BEST.

The T4700 garnered the top scores for its excellent color display, both in screen readability and quality of color. It also fared well in overall reliability but lagged somewhat in ruggedness and durability.

### APPLE PowerBook 180C

**TOTAL  
SCORE 72**

RESPONSE BASE: 50 USERS



RATINGS ARE BASED ON A 1-TO-10 SCALE, WHERE 10 IS BEST.

Apple's PowerBook trailed closely behind Toshiba's product in display quality. The PowerBook was hurt by lower performance and battery-life scores.



**CAIRO, 1996**

*Object-Oriented Computing*



**TALIGENT, 1996**

*Object-Oriented Computing*

**PURE VAPOR.**

---

By now, almost everyone agrees that the future of software is objects. Precisely the type of software we pioneered with NEXTSTEP™ over five years ago.

Well, it appears that we're finally getting some competition – in the form of empty screens. While NEXTSTEP is rapidly gaining industry-wide support and recognition, our competitors-to-be are asking you to wait a year or two just to see Version 1.0 of their object software. Even though history says it's likely to be twice that long – *four years* – before this first draft is deemed trustworthy enough to be used for mission-critical applications.

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The way NEXTSTEP works today.

You might even be able to use objects to develop mission-critical custom applications that integrate seamlessly with all of your legacy and productivity applications. The way NEXTSTEP works today.

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might be able to distribute objects across networks, running them on powerful servers throughout your enterprise. The way NEXTSTEP works today.

Now, if NEXTSTEP object software can deliver such revolutionary gains today, why would anyone want to wait four years for dependable objects from the competition? Good question. And the truth is,

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They're using NEXTSTEP today to construct and deploy client/server systems faster than you could ever imagine with pre-object software, and with greater capabilities. All on industry-standard Intel®-based PCs from the leading computer makers, and soon with RISC workstations from

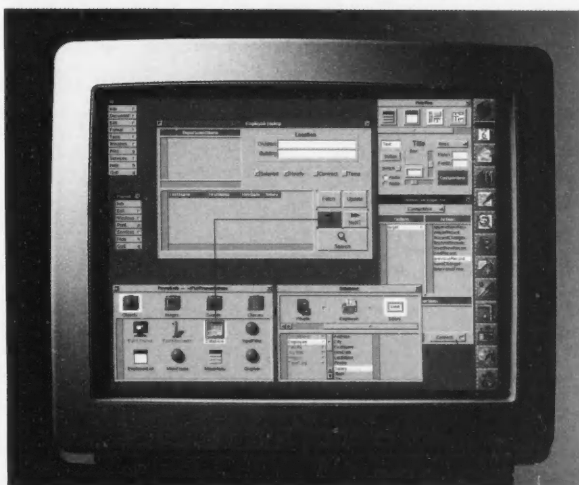
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|--|----------|----------|
| Microsoft                                  | Taligent | NEXTSTEP |
| 0  | 0        | 100,000  |



**THE OBJECT IS THE ADVANTAGE.™**

## Payoffs and pitfalls

CONTINUED FROM PAGE 91

**as secure as that particular access point.** For this reason alone, many companies do not permit direct modem connections to individual desktops. Instead, they require users to access the LAN through a pool of modems installed and controlled by the IS department.

As wireless communications links become more prevalent, the same issues will need to be addressed. The connection point should be at the corporate computing center, most likely in the form of an X.25 wireline connection to the closest access point of the wireless service provider.

Today, the most reliable form of remote communications is still the wired modem. Most hotels provide RJ-11 connections for portable computers, as do most airline clubs. You may even find some pay phones equipped with these jacks.

Wireless one-way messaging services are available on a nationwide basis from companies such as SkyTel Corp., MobileComm, Page-Mart, Embarc and others. Local paging and messaging services are abundant. Two-way wireless services are currently offered by RAM Mobile Data and ARDIS and over analog cellular systems.

RAM Mobile Data and ARDIS provide direct wireless access back to a corporate computing center or via services such as RadioMail to public E-mail and the Internet. Over time, other services will include access to information providers and dial-up services over wireless connections.



**Using the current analog cellular system for wireless data is possible, but it requires a special**

**modem and can be frustrating.** Because cellular systems generate more noise and users may be switched from one cell to another during transmission, the service is not bulletproof. Using cellular systems today is a less than reliable data communications method.

Cellular Digital Packet Data service will eventually provide better connections [for more details on emerging wireless technologies, see CW Guide, March 28]. For now, however, both RAM Mobile Data and ARDIS provide nationwide seamless roaming for wireless data, and users are shielded from transmission errors and incomplete messages by virtue of packet data transmission techniques.

The current wireless networks are too slow for users who want to access their desktop applications and files. ARDIS offers 4.8K and 19.2K bit/sec. transmission, and RAM Mobile Data offers an 8K bit/sec. rate.

However, for short messages or for software that permits more efficient access to the desktop, these services provide reliable access any time, with coverage in about 90% of the major population centers.

Specifically, in wireless technology, the hardware is still not as compact and the services not yet as robust as users want, and end-to-end solutions providers do not have product into the channels yet. **Still, wireless technology is a buyers' market right now.** Because of the slow start and

the limited number of applications available via wireless today, vendors are falling all over one another to draw larger companies to wireless.

This is a great time to engage in pilot projects and implement wireless mobility on a large scale.

Seybold is editor in chief of the industry newsletter, "The Outlook on Mobile Computing."

## The cutting-edge moves

### What kind of notebook computer could you get for \$4,000?

■ The models listed are generalized to illustrate how quickly portable technology has moved forward. Typically, there are several small vendors out in front of the price/features curve, but some stick around for the long haul and some don't.

#### BRAND-NAME MANUFACTURER

#### NO-NAME MANUFACTURER

12-MHz 286 processor  
640K to 1M byte of RAM  
20M-byte hard drive  
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120M-byte hard drive  
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Integrated AC adapter  
Integrated speaker  
6.6 pounds

100-MHz 486DX4 processor  
4M bytes of RAM  
260M-byte hard drive  
Active-matrix color display  
Local-bus graphics  
PCMCIA slots  
Integrated sound card  
6 pounds

## IS tames mobile workers at NationsBank

**R**obert Sutton, technical development manager at NationsBank in Baltimore, has his hands full. In addition to his regular job of evaluating technology for the bank's 25,000 PC users, Sutton also manages some 5,000 portable computers—a job, he reports, that comes with its own special set of headaches.

The army of mobile users at NationsBank consists primarily of loan officers and personal bankers who use a motley mixture of Compaq Computer Corp., Toshiba America Information Systems, Inc., IBM and other 33-MHz 386- and 486-based notebooks and laptops to service customers and catch up with work in the evenings.

The flexibility of working off-site has helped many of these users become more productive, and Sutton says mobile users also tend to be very independent. Be-

cause they keep their computers with them wherever they go, such users also tend to treat their laptops as personal rather than company property.

This attitude can wreak havoc on managers who must impose a degree of control over users' systems, Sutton says. "Many people who use portable computers think they're above the law," he says.

For example, imposing hardware and software standards presents particular problems when dealing with mobile users because many tend to use their discretionary departmental funds to purchase computing tools, Sutton says.

And providing in-house technical support for users working with nonstandard software can cause headaches for the bank's help desk staff.

If mobile users come to rely on software that is not sanctioned by the company, technical support staffers are forced to spend

### Big daddy

NationsBank of Maryland NA is a subsidiary of giant NationsBank Corp., which boasts more than 570,000 employees and nearly \$10 billion in yearly revenue. The parent company is based in North Carolina.

valuable time creating workarounds when users run into difficulties.

"If they run into a software compatibility problem between something they're using and something that we run as a standard, our technicians have to spend their time writing specialized routines to swap .BAT files and the like," Sutton says.

Data security also tends to be more difficult with mobile users, Sutton says. Because they tend to insert floppies haphazardly into their machines, virus protection is more problematic than it is with desktop computers, he says.

And because security is paramount, the bank allows mobile users to access only local hosts and not its wide-area electronic-mail network. "They want to be able to get access to the WAN when they're in a hotel room, and though we explain why we can't let them, they still resent it when they want to get on the network,"

Sutton says.

In addition, mobile machines can be the source of unplanned costs. Because users often order machines with too little memory to run applications adequately, the company may have to shell out extra dollars for memory, communications software and hardware and installation, he says.

To mitigate such issues, it's a good idea to spell out exactly what kind of hardware and software the company recommends, provide lists of what it will and will not support and put together a carefully planned tracking system, he says.

Sutton also recommends creating an inventory of mobile hardware and software as soon as a machine is purchased and surveying users regularly to find out what kind of software they're running.

Fryer is a free-lance writer in Menlo Park, Calif.



# 75MHz.



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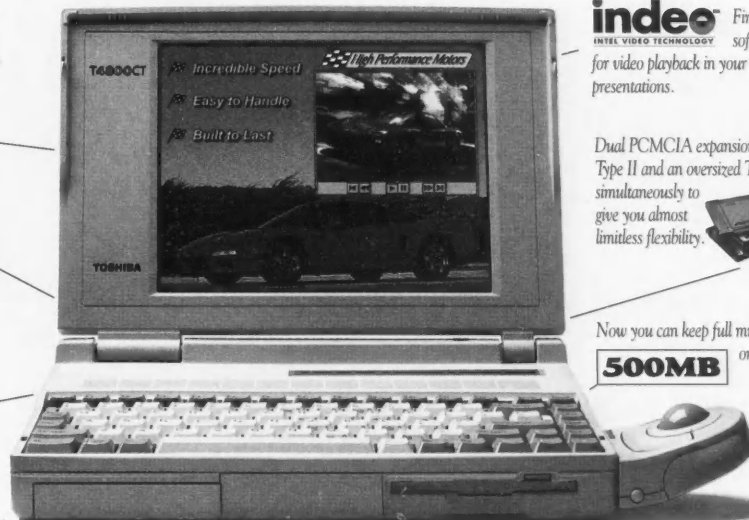
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# Compaq's Contura Aero:

## An economical, reliable subnotebook

### Contura Aero

Computerworld's Firing Line is an evaluation based on interviews with major users at corporate and educational installations. The product under evaluation is being used in live application environments.

- Contura Aero from Compaq won high user ratings for reliability, compatibility and documentation.
- Evaluators also commented that Contura Aero showed average performance and slightly higher-than-expected support costs.

**A**mid the ongoing price-reduction trend in notebook computers, Compaq Computer Corp.'s February release of the budget-priced Contura Aero 4/25 was no great surprise.

One of the leaders in notebook and laptop computing, Compaq already has a number of portable systems on the market with its LTE Lite systems. Contura Aero, which offers a slower Intel Corp. i486SX processor, also comes with a lower price than the company's other models.

Priced at roughly \$1,400 for a monochrome unit with a 170M-byte hard disk and 4M bytes of RAM, Contura Aero still requires a \$179 floppy drive. That brings it into the price range of other notebook systems.

A new, passive-matrix color version of Contura Aero—with a faster, 33-MHz 486SX processor—began shipping last month for a slightly higher price of about \$2,200.

Users assisting in this evaluation included technical and management personnel from a psychological counseling practice, a manufacturing company, a business consultancy and a national publishing firm. All users had been working with Contura Aero for more than one month.

The format for this evaluation was created with assistance from Howard Rubin Associates and Technology Investment Strategies Corp. Due to the absence of significant user criticism, a vendor response was not requested from Compaq.

#### Reliability

Compaq has a reputation for quality manufacturing, the evaluators agreed. They said this was a pri-

mary reason for selecting Contura Aero rather than any of a number of alternative subnotebook systems. They reported no problems with reliability.

Manufacturer: "Other than people dropping the units, we haven't had too many problems."

Consultancy: "Notebooks in general are more likely to be abused, so quality control is very important."

#### Compatibility

The evaluators had no difficulty running standard DOS or Windows software. They said PCMCIA peripherals such as modems and network cards ran flawlessly.

Manufacturer: "There were no problems. Everything worked fine."

Publisher: "We didn't run into any surprises with our software suite. It ran as expected."

#### Performance

With a 486SX running at 25 MHz, Contura Aero turned in reasonable performance results, the evaluators said. Although none of the evaluators had run formal benchmarks, all said performance was within expectations. In addition, they concurred that battery life—which Compaq rates at six hours—was better than expected. They said the 486SX processor was the bare minimum needed for Windows applications.

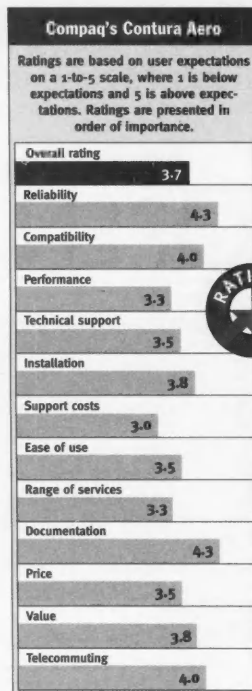
Counselor: "It runs a bit slower than we expected."

Manufacturer: "So far performance is very good. Battery life seems much better than we expected."

Consultancy: "The battery lasts a very long time."

#### Technical support

Compaq offers a comprehensive



much easier and less costly to support."

#### Ease of use

Contura Aero was no more or less difficult to use than other notebook computers, the evaluators said.

Three of the four evaluators offered their users training, which included using the optional drives and performing file transfers. Other users needed Windows training.

Manufacturer: "We had to set up classes and do training for Windows."

Publisher: "The trackball and the graphical user interface make it easier to use than it would otherwise be."

#### Range of services

Contura Aero comes with standard accessories such as a rechargeable battery, an AC adapter and a data transfer cable.

Software for Contura Aero is limited to DOS, Windows, the Winlink file transfer software and Lotus Development Corp.'s Lotus Organizer.

Consultancy: "PCMCIA makes it easy for third parties to develop peripherals and make money. The end result is more products for users."

#### Documentation

Contura Aero offers very good documentation, the evaluators said.

Manufacturer: "It's not voluminous, but it is easy to follow."

Consultancy: "People don't really need the documentation for most of the things they do."

#### Price

The evaluators all paid about \$1,600 for the standard Contura Aero with a 170M-byte hard drive and 4M bytes of RAM. All units were purchased with the optional floppy disk drive, which connects to Contura Aero via the PCMCIA port.

Publisher: "People who want to spend less than this for a workable notebook are dreaming."

#### Value

Contura Aero provided slightly better value than expected, the evaluators said. ■

Written by Computerworld senior editor Garry Ray.

# Pumped <sup>up</sup> power

## Notebooks to gain battery life and storage strength

**W**ireless communications is the sexiest topic in mobile computing right now. But during the next year, mobile computer users can expect to see big gains in two areas that are more mundane but probably more important: battery life and data storage.

In fact, "this is the year of the battery," claims Ken Dulhaney, vice president of mobile business strategies at Gartner Group, Inc.'s Santa Clara, Calif., office.

The biggest transformation lying in wait is the mileage the batteries will get between recharges. New technologies, including zinc-air and lithium-polymer batteries, will approximately double the useful life of the typical notebook battery pack from three to six hours, Dulhaney says.

### Longer lasting


For a notebook-size 486 computer with a monochrome screen, the runtime with zinc-air batteries can extend to 10 hours, according to zinc-air battery maker AER Energy Resources in Smyrna, Ga.

Another advantage of zinc-air technology is that these batteries have no "memory" effect like that of nickel cadmium batteries. That means users can recharge without first fully discharging the power pack.

On the downside, however, the batteries will last for only 40 to 50 recharge cycles, unlike NiCad batteries, whose lifetime extends through 200 to 500 cycles. In the long run, both types of batteries will deliver approximately the same length of service — about one year's use for a heavy mobile computer user, according to AER.

At least one portable vendor, Zenith Data Systems, has definitely agreed to offer AER batteries as an option in future portable computing products. Such products are nine to 12 months away.

Because of their size, zinc-air batteries probably will be used only in notebook computers. Subnotebook and smaller machines are unlikely to sacrifice any of their size advantage for a



**Remote access gets simpler**

- Take a close look at Xylogics, Inc.'s Access Three remote access server — because it may disappear.
- Xylogics has signed an agreement with Cabletron Systems, Inc. to integrate Access Three's technology, along with up to 12 modems, directly into Cabletron's hubs. Xylogics has a similar agreement with SynOptics Communications, Inc.
- That lets users centrally manage remote access on the hub, using Simple Network Management Protocol and other standard network management tools.

longer-life battery; instead, they may move to lithium-polymer batteries.

While no commercial products have made it to the market, several companies, including IBM, are looking closely at lithium-polymer because of its energy density — in other words, more power storage in less bulk.

Lithium-polymer batteries may offer up to 55% greater energy density than current nickel metal hydride technology. In addition, the shape of these batteries is malleable, allowing them to be molded to fit the limited space in sub-notebooks.

### Storage options grow

Another area where big gains can be expected is in the size and flexibility of data storage for notebooks, subnotebooks and personal digital assistants (PDA).

The average fixed hard drive will increase in size about 40%, from 120M to 200M bytes, says John Hulak, senior industry analyst at BIS Strategic Decisions in Norwell, Mass. Unlike most advances, this will not cost users additional money, he adds. Prices will remain at about \$1 per megabyte.

The bigger change, however, will come in the removable disk arena, as the PCMCIA drives and the slots to use them become more readily available.

A number of companies, including Maxtor

Corp., MiniStor Peripherals Corp., Integral Peripherals, Inc., Aura Associates and Calluna Peripherals, have readied products for this potentially large market. According to Gartner Group, 1 million notebook-size computers equipped with PCMCIA slots were sold in 1993. This figure is expected to jump to 3 million this year and hit 6 million in 1995.

### Big storage, small space

PCMCIA drives are based on 1.8-in. removable disks that use compression algorithms to increase the effective storage space. Maxtor recently announced the largest available PCMCIA disk, the MobileMax 131. This disk offers 131M bytes of storage in a credit-card-size device weighing 65 grams.

Improved magnetic storage technology is not the driving force in PCMCIA capacity. Instead, more shock absorption in the packaging is enabling vendors to produce more stable, rugged PCMCIA products.

But increased mobile storage opens up another problem, according to Dulhaney. "With that growth, people have to be concerned about backup issues," he says. Mobile backup is not a popular concept, and "people won't do it."

Backup problems, as well as maintaining synchronization with desktop computers, may be eased by the increasing number of desktops that are being equipped with PCMCIA slots. That will allow users to swap the same PCMCIA storage card between desktop and portable PCs. Gartner Group predicts sales of more than 900,000 PCMCIA-equipped desktop PCs in 1995.

### Recognize this?

An area in which mobile computing users won't see any respite is handwriting recognition capabilities. That will continue to hamper the acceptance of PDAs such as the Newton MessagePad from Apple Computer, Inc., Tandy Corp.'s Zoomer and the most recent entrant to the market, Motorola, Inc.'s Envoy.

"Handwriting is proving to be the way not to go," Dulhaney says. "It's stuck in limbo for a while." Handwriting recognition remains simply too unreliable for many users to employ. Without the ability to convert handwriting into data that can be manipulated, such devices are little better than pencil and paper.

Instead, with the PDAs, "people are using software-provided keyboards for data entry," Hulak says. "Until handwriting can replace true pen and pencil, other forms of entry will be the mode of choice."

Jenkins is a free-lance writer in Ansonia, Conn.

**Wondering about wireless:** Despite the hype, only 11% of 200 notebook users surveyed use wireless modems.

### Compression standards keep modems cranking

- External data/fax modems are cranked up to transmission speeds as high as 28.8K bit/sec. But pocket and PCMCIA faxes, such as the Hayes Microcomputer Products, Inc. Optima card, reach only 14.4K bit/sec.

- With data-compression standards, though, data can be pumped through quite a bit faster — as long as the sender and the receiver support the same compression protocol.
- U.S. Robotics, Inc. has announced Courier modems that support three major high-speed protocols — V.32 turbo, V.42 and the new V.34 standard — making a compression protocol mismatch unlikely.



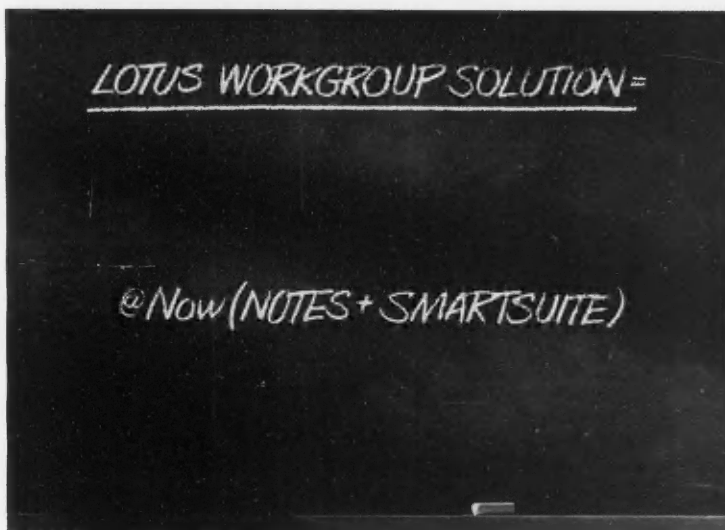
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( TRANSLATION: In 12-24 months, you take NT, EMS and Cairo (lower your expectations by a factor of 3), multiply it by VBA and VB, and of course it's going to require a good dose of MAPI and SQL, not to mention the combined functions of Access and Microsoft Mail. Get rid of your OS/2, UNIX and Netware and add Office. Then multiply the outcome by delivery dates adjusted for reality. )



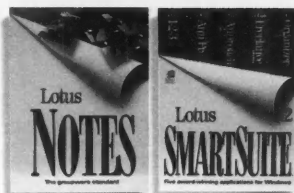
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Microsoft's strategy lacks the range and quality of applications and depth of workgroup features already designed into Notes and SmartSuite.

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'Microsoft's hybridware foray will fall short for three reasons: (1) Failure to understand the Fortune 1,000 MIS... Any Notes wannabe that requires MIS to do heavy lifting will fail. (2) A Windows-centric view of the world. Notes' multi-platform support is a central selling point. Forrester does not expect that Microsoft will change its stripes and support non-Microsoft operating systems. (3) Lotus' lead'

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# In Depth

## E-MAIL

## TRAVAILS

Users love LAN-based E-mail, but dicey reliability, security and system management can mean headaches for IS managers

TO: Computerworld editors  
FROM: AJenkins  
CC: All  
RE: IMMATURE TECHNOLOGY  
OK, here's the thing of it: As you requested, I've been interviewing everybody and their little brothers about the problems with LAN-based E-mail reliability and security. What the users have been telling me is that the technology is young, and administration is complex.  
I just got off the phone with this guy out West and one thing is becoming really clear: Users are pushing this LAN E-mail technology beyond what it's capable of right now.  
It's causing some problems.

**R**on Muller is one busy guy. Muller, the electronic-mail administrator for the Metropolitan King County government in Seattle, supports about 1,200 users on Novell, Inc. networks using Enable Software, Inc.'s Higgins E-mail application. He also maintains another 400 users using Microsoft Corp.'s Mail.

Digital Equipment Corp.'s MailBus, running on a DEC MicroVAX 3100, serves as a central router and gateway for the 30 networks and to the Internet.

On a typical day, Muller's system routes 1,500 messages among the networks and an uncouned number of messages that never traverse the backbone but remain within each department's LAN.

Last year, the Higgins system accounted for 500M bytes of information. It was also breaking down, on average, two times a week, Muller says. "There was really no one in charge of the mail system. I was do-

ing what I could in my spare time, but it was becoming unreliable."

Early this year, gateways were also crashing. At one point, it took Muller a day and a half to find and resolve the problem, which turned out to be a message sent from a Macintosh user across the X.400 gateway to the Higgins system. The message was a new type of data plot file that the X.400 wasn't prepared to handle.

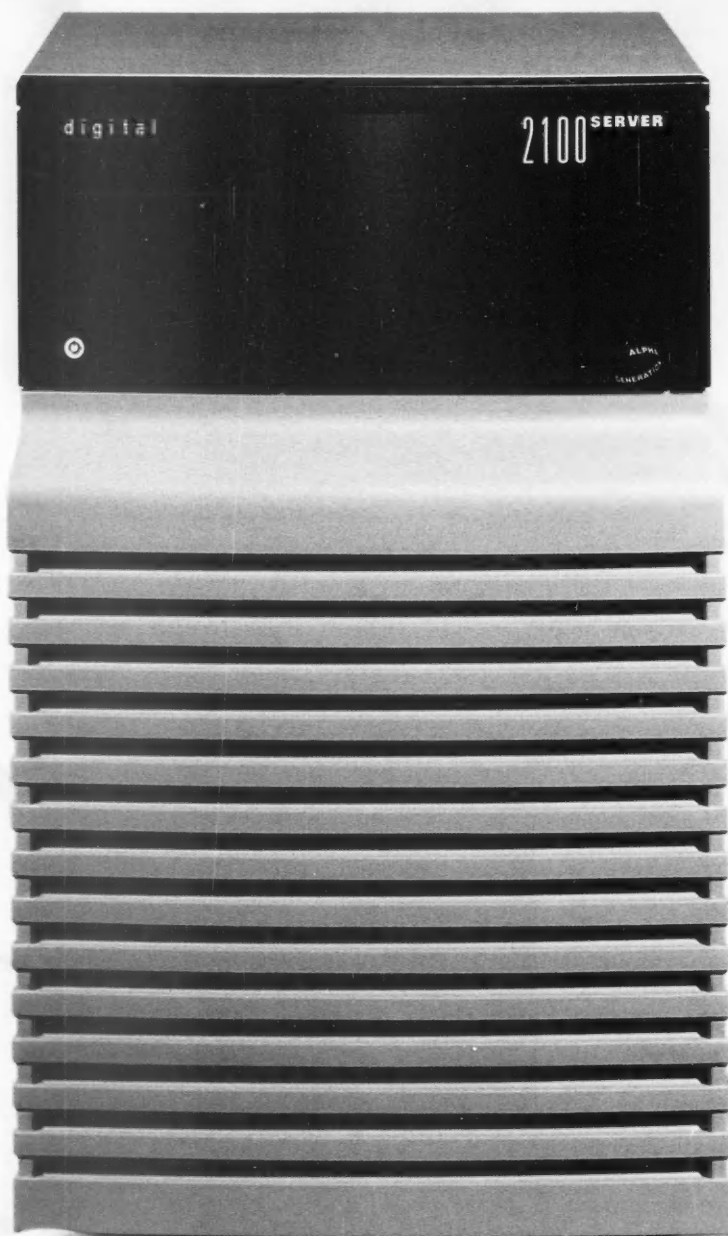
Muller attributes Higgins' temperamental nature to the tremendous use it gets at his firm. When users found E-mail was only as good as its number of ad-

US WEST'S STEVE DICKSON: 'Departmental LAN administration is not very highly valued'

BY  
AVERY L.  
JENKINS

Jenkins is a free-lance technology writer in Ansonia, Conn.

Travails, page 104



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| <b>INTERNAL RAID</b>       | Yes   | No                    | No  | No                            |
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# "THERE ARE ALWAYS ONE OR TWO RENEGADES."

RON MULLER  
ELECTRONIC-MAIL ADMINISTRATOR  
METROPOLITAN KING COUNTY  
SEATTLE

## Travails

CONTINUED FROM PAGE 101

dresses, the application mushroomed.

"We just let the system grow on us," Muller says. "We are using the system beyond how it was meant to be used." Muller says his 1,200 users and 1,500 daily internetwork messages are pushing the practical limits of the application.

Muller has another source of anxiety: He's running beta versions of the client and server portions of the E-mail application. He says he would be more secure working with a mature product with proven reliability.

Muller is trying to ensure reliability by spending more time on system administration. He's applying monitoring tools to track when peak loads occur and pinpoint system bottlenecks.

"I guess that's job security," he says. ■

TO: Computerworld editors  
FROM: AJenkins  
CC: All  
RE: THE ORGANIZATION MAN  
It seems that pushing the technology envelope isn't the only problem cropping up with LAN-based E-mail. Organizations are also trying to cope with managing these things and with figuring out how to get the people who do it a little help.

"It's really an organizational thing," says Steve Dickson, messaging network manager at US West Technologies in Denver. "The real key for reliability is how the server is taken care of in the first place."

The technologies division of US West is the information services supplier for the company as a whole, and Dickson has been helping users migrate from their mainframe-based IBM Professional Office System (Profs) to Lotus Development Corp.'s CC:Mail.

US West employs a highly decentralized approach in which LANs and their management are under the direct control of the groups they sup-

port. Funding within each department for LAN computing can vary widely, Dickson says.

Unfortunately, "departmental LAN administration is not very highly valued and not very highly staffed," Dickson says. "There's not a good perception that [LAN administration] is a necessary thing to do."

This is one of the concepts that Dickson tries to emphasize when departments come to him to add internetwork E-mail onto their systems. "By adding more applications to an already overloaded department LAN administrator's job, you are going to compromise quality," he says.

Another organizational prob-

lem stems from the bottom-up growth of LAN E-mail. Departmental LANs become united like the ancient Greek city-states: Each has its own culture and customs. The result has often been a Babel-like collection of incompatible addresses across the organization.

King County's Muller oversees departments throughout the government that, for the most part, are free to establish their LANs and applications any way they see fit. Muller offers departments guidelines for security, passwords and user names but cannot directly enforce conformance.

"Ninety-nine percent of them follow our guidelines," Muller says, "but there are always one or two renegades."

Dickson says users will often come to him after their departmental LANs have been up and running, wanting to connect to the backbone. Their addresses must conform to a standard in order for them to do so, and "people have gone through and done fairly major overhauls" to get up to standard, he says.

For example, systems have been set up using first name followed by last name instead of the company standard "last, first" user names, Dickson says. When a department wants to join the backbone, it has to change all user names.

Adding to the administrator's woes, Dickson says, is the lack of industrial-strength E-mail utilities to help manage the system.

LANs built around minicomputers such as the DEC VAX have it easier in this regard because products to streamline and centralize management of distributed LANs already exist.

Unfortunately, there are few such products for the PC LAN environment.

"Five to 10 years ago, you didn't have hundreds of people on the file server," Dickson says. "The directory databases are getting much, much larger. The larger your database grows, the larger the need for administration and utilities."

Bill Wyatt, manager of global messaging at Fluor Daniel, Inc. in Greenville, S.C., agrees that

the LAN environment sorely lacks the tools available in the minicomputer or mainframe world.

Wyatt manages a worldwide E-mail system with 100 post offices serving 15,000 users in 23 countries. The users, all on DOS or Windows platforms, are linked through Novell networks and dial-up lines.

"Most of the products we are using to manage the system we developed ourselves," Wyatt says. For example, one utility is constantly sending out "bogus"

messages to the various post offices. If it doesn't receive the proper error message back from the post office, it automatically broadcasts the problem to management personnel.

Wyatt adds that there are no outages directly attributable to the E-mail application. "If we have any outages, it's because the server crashed, not the E-mail."

Muller also has this "bogus message" capability through DEC's MailBus router, not through his PC E-mail system. ■

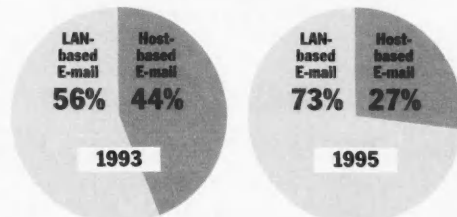
TO: Computerworld editors  
FROM: AJenkins  
CC: All  
RE: LOOSE DATA  
Fred Gluck, president of Datamedia Corp. in Nashua, N.H., just passed along some interesting information. He says that according to a recent Electronic Messaging Association study, 25% to 30% of messages "are considered to be sensitive documents." Security is clearly on managers' minds.

"E-mail inherently is not secure," says Mike Moniz, electronic security officer at the Bank of Butterfield in Hamilton, Bermuda. "Yes, you have a challenge mechanism [such as passwords], but that mechanism is easily defeated."

The Bank of Butterfield is implementing a system that will support 2,000 users on PCs through  
*Travails, page 108*

## THE SHIFT IS ON

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Source: Creative Networks, Inc., Palo Alto, Calif.

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# "E-MAIL INHERENTLY IS NOT SECURE."

MIKE MONIZ  
ELECTRONIC SECURITY OFFICER  
BANK OF BUTTERFIELD  
HAMILTON, BERMUDA

## Travails

CONTINUED FROM PAGE 104

Novell networks and X.400 lines.

"We are grappling with a serious situation when you link E-mail outside the organization," Moniz says. "You can transfer volumes of information with the flick of a switch."

Two key elements of security, he says, are nonrepudiation and authentication. That is, the message recipient must be able to reliably assume that the originator did send the message, and there must be a way to ensure data privacy. Only then, Moniz says, can a company safely allow its employees to act on information received via E-mail.

But all the news is not bad news for security. Some companies lock their equipment in a secure room. For instance, Fluor Daniel's routers and gateways are kept in a room with limited access, Wyatt says.

Wyatt says he thinks the LAN-based E-mail systems are more secure than host systems. CC:Mail, for instance, encrypts

both the data going across the wire and the message database. Profs, on the other hand, stores all information, as well as backups, as plain text, leaving security holes.

CC:Mail's interserver communications, he adds, are post office-to-post office communications, meaning that neither server actually logs on to the other. Thus, the data stored on each server remains secure because neither has access to the other's vital information.

Muller has addressed security primarily through policy and technology. The E-mail system requires users to change passwords every 180 days.

Muller and others point out that the distributed nature of their systems also serves as protection. In a host-based system, entry at one point gives an electronic intruder access to most of the system. Distributed LANs are protected by their relative isolation from one another.

"With Profs, all your eggs are in one basket," Wyatt says. In a LAN environment, however, there is no single point of failure for E-mail. ■

his staff manually update directories on the school's 25 LANs using Attachmate Corp.'s ZIP: Office when the number of additions, deletions and changes reaches a noticeable level.

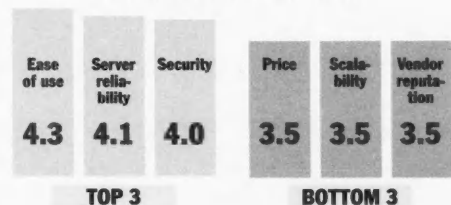
Muller updates his system twice weekly but is changing to a more automated process.

"Before we had directory synchronization, we just had a simple gateway, and every time I added or deleted a user I had to do it on three different systems," he says. Muller has eliminated that problem with a central router. All internetwork traffic passes through it, eliminating the need to copy new addresses across the system. ■

## E-MAIL MUST-HAVES

When looking at E-mail features, what is most important to you?

Scale: 1 (not important) to 5 (very important)



Base: 103 user organizations  
Source: Creative Networks, Inc., Palo Alto, Calif.

TO: Computerworld editors  
FROM: AJenkins  
CC: All  
RE: BETTER THIS THAN NOTHING  
Despite the problems I've been outlining for you, those who have chosen LAN-based E-mail seem pretty happy with it. They'd rather be synchronizing those directories than be stuck behind the technology curve with a host-based system.

## OVERHEARD

A tech chief's worst nightmare must be having such quirky LAN E-mail that it affects end users' work.

One Saturday morning, for instance, around 10 a.m., I was in a branch of a large retail chain and overheard a store manager on the phone with one of his assistants.

"No, I don't care," he snapped. "Get Mary on the phone. I need somebody in here who knows how to work this damn E-mail."

Meanwhile, the store's security officer was poised in front of the PC, wading through the files, fruitlessly searching for a message with critical truck shipping and delivery information.

Fortunately, they found the message. But I kept thinking about the time lost as freight waited, unloaded, while the search went on; if they hadn't found the messages, it could have meant lower receipts.

Whenever I go back into that store, I wonder whether the E-mail manager still has his job.

—Avery L. Jenkins

TO: Computerworld editors  
FROM: AJenkins  
CC: All  
RE: DIRECTORY WOES  
One development that will meet with universal approval from IS managers is a way to automate directory synchronization that actually works. When there was one central directory for host E-mail, this wasn't even a concern. Now it's keeping E-mail administrators up at night as they try to keep up with changes.

Wyatt would rather be on LAN servers than on a host-based system, in part, he says, because LAN servers are more reliable for the overall organization.

"If one server goes down, just that small sample of people loses service," he says.

For its part, Florida State's system has been 95% reliable, Graves says. "The advantage to LAN-based E-mail is ... better speed and better

end-user functionality," he says. That is, users are able to integrate their mail-derived information directly into things such as spreadsheets, reports and so on.

Dickson adds that companies like LAN-based E-mail systems because they reflect the distributed direction in which many businesses are going. "We're a regional organization," Dickson

says. "For example, I work in Denver and my boss works in Bellevue, Wash. Every group is a distributed staff group."

The thing to remember about LAN-based E-mail, Muller says, is that it has a way of sneaking up on you because users like it. The idea is to be prepared. "Don't think your small system will stay small," Muller warns. ■

"We have had a hell of a time getting synchronization to work," says Bob Graves, assistant director of university computing at Florida State University in Tallahassee. "We got [synchronization] started, but we couldn't get it to time itself properly. We didn't know which names it was taking from where."

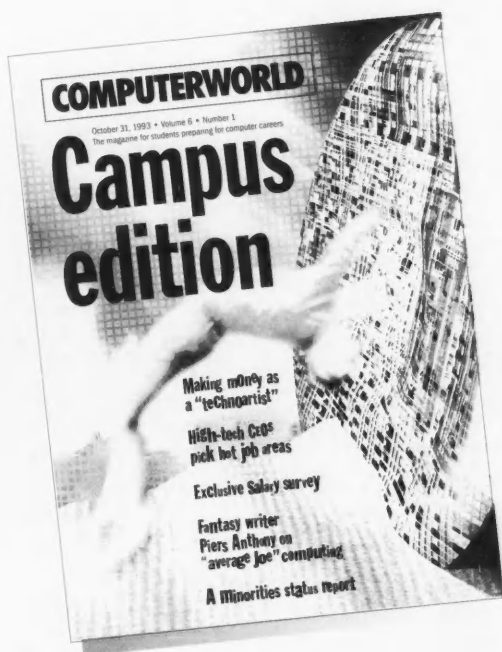
Graves has taken the manual approach: He and

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# Take CONTROL

110 COMPUTERWORLD MAY 9, 1994



# Build, evaluate, revise

## When adjusting to iterative development, focus on the essentials first and leave the minor details until later

By Paul Winsberg and Daniel Richards

Imagine commissioning an architect to design your new home. After reviewing the floor plans, material specifications and other design documents, you're disappointed when the finished house doesn't match your dream. What went wrong?

You probably couldn't tell if the design met your needs because it was difficult to visualize the house from the abstract plans. Also, you realized what you really wanted only after you moved in.

The same is true when building software. Narratives and diagrams are incapable of conveying the look and feel of a system, and users uncover important requirements only after using the system.

It's to your advantage to create a work-

ing prototype, let the users drive it, then iteratively refine the model based on feedback. A user-centered approach results in higher quality and significantly reduces maintenance by delivering applications that work the first time.

Unrealistic hopes can quickly get you into trouble when prototyping, however. Despite what rapid application development proponents say, the benefit of an iterative, participatory design approach is a better business system, not increased programmer productivity.

Users may also believe the prototype is the finished system. While it may look great, it lacks the essential features of a production system such as transaction management and exception-handling.

Similar to building a house, the owner is elated when the frame, roof and siding are built quickly, but he is discouraged when the less visible plumbing, electrical work and finish carpentry take months more to complete.

### Starting the job

Start off right by reviewing the plan with users and setting realistic goals. Explain that prototyping is a participatory process that requires frequent reviews and works best when users are authorized to make immediate decisions.

Iterative design extends traditional methods rather than replaces them by adding prototyping and usability testing

to proven structured techniques (see story at right). Don't make the mistake of diving into windows and widgets without clearly understanding the business problem and specifying requirements via high-level entity relationship and flow diagrams. What's needed is a balance between discipline and chaos, and between structure and spontaneity.

Select a visual programming tool that comes with an integrated database and other productivity features so you can rapidly explore many design variations. Quickly build rough versions of the major windows needed to support a single business function such as order entry. Focus on providing the essential data, actions and

navigation, not on detailed presentation concerns such as color, fonts and layout. As soon as the first set of windows is complete, let the users test-drive them to determine whether you have directly and intuitively addressed their needs.

Stick with a depth-first approach, refining and expanding the initial scenario until it is detailed enough to serve as a standard for the rest of the system. And while frequent reviews are essential, do not fall prey to scope creep.

Don't try to reinvent the wheel. Follow an existing user interface standard such as IBM's Common User Access, Microsoft Corp.'s Windows Style Guide, or better yet, one developed by your own company.



## Getting feedback

Usability testing goes hand in hand with prototyping to form iterative design's build/evaluate/revise life cycle.

While it can be a major production, many of the same benefits can be achieved with a fraction of the cost through informal usability reviews. Here are some tips from professionals:

- Select a variety of participants representing different job functions and levels of computer expertise. Recruit new people periodically to ensure a fresh perspective.
- Prepare for the session by creating several scripts that clearly state concrete tasks for participants.
- Resist the temptation to coach participants. In fact, someone other than the developer should conduct the session.
- Avoid fancy equipment. Simple observations work just as well. Carefully note the participants' actions, comments and body language as they struggle to understand and use the system.
- Don't get upset when the participants criticize your design.

Winsberg and Richards teach database design and client/server seminars for DataBase Associates, a research and consulting firm in Morgan Hill, Calif. They can be reached at 6586740@mcimail.com.



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### INFORMATION TECHNOLOGY SPECIALISTS: HELP US CREATE OUR INFO SUPER HIGHWAY

**R**yder System, a \$4 billion global leader in transportation services, is currently taking a major step in deploying an organization-wide information infrastructure. Our multi-platform environment includes IBM mainframe, AS/400, RS 6000 and client/server technologies. You can be part of our dynamic team.

All positions require a high level of proficiency, a BA/BS degree and strong written/verbal communication skills.

• **Capacity Planning Manager** - Requires 5-7 years of capacity planning and performance analysis experience with emphasis on multi-platform environment. Must also have 2+ years management and supervisory experience, effective communication and teamwork skills. Client/server experience preferred.

• **Network Capacity Planning and Performance Analyst** - Requires 4+ years capacity and performance management experience related to LANs, WANs and communication equipment. Experience with TCP/IP, CISCO routers, Ethernet, Novell preferred.

• **Project Manager, Technical Services** - Requires 5+ years project management experience and a solid understanding of project planning, project control, resource scheduling and systems development methodology. Must also have basic understanding of data center/technical services; excellent communications and teamwork skills; BS degree. MBA preferred.

• **AS/400 Technologist** - Must have 3-5 years experience with AS/400s in a distributed environment; familiarity with AS/400 communications and LAN connective issues (SDLC, SNA, Token Ring, Ethernet). Must also be familiar with OS/400 issues and licensed products; CL programming and some COBOL; knowledge of AS/400 hardware and attached devices.

• **RS/6000 Technologist** - Requires 3-5 years experience with UNIX systems including at least two years on RS/6000; familiarity with IBM and other vendor products. Backup and Recovery procedures and TCP/IP, NFS, DNS, and SNA experience a definite plus. Exposure to Xstations, remote printing and scanners also a plus.

Along with the lifestyle of beautiful South Florida, we offer competitive salaries, excellent benefits, relocation assistance and ongoing growth potential. Qualified individuals should mail resume to: **Ryder System, Inc., Human Resources Dept., Box 81-04, 3600 NW 82nd Ave., Miami, FL 33166.** Ryder is an Equal Opportunity Employer. Drug Testing is a condition of employment with Ryder.

# RYDER

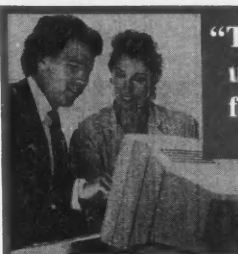
### PROGRAMMER/ANALYST OPPORTUNITY IN OLYMPIA, WA

U.S. Intelco Networks, a leader in the telecommunications industry and headquartered in Olympia, is seeking an experienced Programmer/Analyst. Must have solid Windows/PowerBuilder development experience including MDI and experience applying object oriented concepts. Development experience with an RDBMS (Sybase) strongly preferred.

Qualified candidates please send salary requirements with cover letter and resume to:

P/A Search  
P.O. Box 2909  
Olympia, WA 98507  
Fax: (206) 493-6233  
EOE

 **U.S. Intelco Networks**



**"The Registry's specialized resource team understood my expertise and quickly found the right assignment for me."**

*Dillon Burfield, Software Consultant*

As a leading full-service information technology consulting firm, The Registry provides clients with a variety of business solutions. For two years running, we've been rated as one of the fastest-growing companies in the US by INC. Magazine — and 1994 will be no exception!

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#### Office Spotlight

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- DB/2, CICS, COBOL
- BAL/Assembler, MVS
- AS/400, RPG/COBOL
- Technical Writers

Contact: Mike Luther  
or Cliff Clemmons  
800-255-9119  
404-252-9119  
Fax: 404-257-0566



**The Registry**

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Member NACCB

### VAX DATA CENTER MANAGER

Fortune 500 firm is consolidating several VAX sites into a central cluster site. The company is seeking a data center manager with experience managing a large cluster environment providing 24 hour, 7 day a week service to local & remote locations.

The successful candidate will be degreed, conversant with current DEC technology, and have successfully managed a VAX data center involved in a major hardware/software consolidation effort. Our client is prepared to fill this critical need NOW and offers a highly competitive salary and relocation package!

### SOFTWARE PRODUCT DEVELOPERS & MANAGERS

Our clients have several openings for managers, product developers and product support professionals. These positions are with vendors of IBM mainframe system software products and require coding experience in assembler and knowledge of DB2 or IMS or CICS or VTAM/BCP.

### PROGRAMMER/ANALYSTS

The economy is improving and so is the market for experienced Programmer/Analysts. Our clients across the country have immediate needs for P/A's with AS/400 RPG II or IBM COBOL with CICS or DB2 or IMS. Banking or Life Insurance a BIG plus.

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We have 300 affiliated offices throughout the U.S. and Canada to assist in your search.

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Houston, TX 77289-0723  
713/488-7961 • FAX 488-1496



### SAP Consultant R/2 and R/3 Systems

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If you are an experienced, quality-oriented SAP professional, a team player with exceptional problem-solving and analytical abilities and a proactive approach, please forward your resume to: J. Harris Findley, Inc., ATTN: Ms. Beth Miller, P.O. Box 552, Sycamore, Illinois 60178. EOE

### LEAD GUI SPECIALIST

PBC, Inc., a front-runner in the race toward open systems solutions, is selectively seeking candidates for a key position in our new product development group.

If you have significant experience with one of the major GUI development tools like:

- SDK
- MOTIF
- GUPTA/SQL WINDOWS
- POWERBUILDER
- VISUAL BASIC
- VISUAL C ++

and you feel strongly that you are ready to move up to a Technical Lead role, then we would like to talk to you. Management experience is not required.

PBC, Inc. is a very rapidly growing software development, systems integration, and information systems consulting firm, with offices in five major cities across the country. If you meet the above qualifications, or you are interested in finding out about other opportunities with our organization, please call, fax or mail current resume to:

**Pittsburgh Business Consultants, Inc.**  
411 7th Avenue, Suite 1401A  
Pittsburgh, PA 15219  
phone: 412-391-0714  
fax: 412-391-0478



## Computer Careers

### Midwest

**CPU, Inc.**  
An Information  
Technology Company



At CPU we know that our principal resource is our people. That is why we have committed ourselves to attracting and developing the most talented information systems professionals to work on challenging, leading edge assignments.

CPU consultants work in Open Systems/Client Server and other cutting edge technology, as well as traditional environments. CPU offers a diverse client base of Fortune 500 companies on the East Coast, Mid-West, and South-West.

CPU is actively and continually recruiting information systems professionals with at least two years of impressive industry experience.

We have a significant number of opportunities and challenges at several of our branches:

|   |  |
|---|--|
| <b>Rochester &amp; Syracuse, New York</b> | <ul style="list-style-type: none"> <li>- AIX/UNIX Systems Administrators</li> <li>- Visual Basic Programmers</li> <li>- Oracle DBA/Developer</li> <li>- Powerbuilder Developer</li> <li>- SAP</li> <li>- Sybase</li> <li>- C++, UNIX</li> </ul>  |
| <b>Cleveland &amp; Akron, Ohio</b>        | <ul style="list-style-type: none"> <li>- INGRESS/UNIX (Project lead, Sys. Admin)</li> <li>- Visual Basic Programmer</li> <li>- Progress</li> <li>- Adabas/Natural</li> </ul>   |
| <b>Reston, Virginia/Washington DC</b>     | <ul style="list-style-type: none"> <li>- Pyramid/LAN/WAN/UNIX (Cust. Support Eng.)</li> <li>- DEC VAX/VMS/DCL (Technical Support)</li> </ul>   |
| <b>Dallas &amp; Houston, Texas</b>        | <ul style="list-style-type: none"> <li>- Visual Basic Programmer</li> <li>- UNIX, C, C++</li> <li>- Powerbuilder Developer</li> </ul>  |
| <b>Tampa &amp; Orlando Florida</b>        | <ul style="list-style-type: none"> <li>- IBM Assembler, AFP, MVS</li> <li>- MVS/ESA (Software Testing)</li> <li>- Tandem/TAL/TACL</li> <li>- Oracle/Informatica/DB2/Teradata DBA's</li> <li>- Powerbuilder/Sybase</li> <li>- Oracle Financials</li> <li>- Tech. Writer/Topology</li> <li>- Synon Certified</li> <li>- Microlocus Cobol/PC Knowledge</li> </ul> |

**For immediate consideration please fax or mail your resume to:**

**CPU, Inc.**  
Corporate Recruiting Center  
345 Wood Cliff Drive  
Fairport, New York 14450  
Phone: 1-800-374-4278  
Fax: 1-716-385-7918

## DATA PROCESSING & ENGINEERING CAREER FAIR 5/16-17

Michigan Technical Recruiters' Network invites you to meet decision makers of these Detroit area companies:

|                             |                                |
|-----------------------------|--------------------------------|
| Adia Information Tech       | Ford Motor Co - Powertrain     |
| Analysts International Corp | Gale Research Inc              |
| Analytical Technologies Inc | Keane Inc                      |
| Bartech                     | Kelly Professional Services    |
| CAP Gemini America          | Intercontinental Brokerage Inc |
| Coopers & Lybrand           | Manpower Technical             |
| Computer & Eng Services     | PLATINUM technology            |
| Comprehensive Data Proc     | RST                            |
| Computer Horizons           | Resource Technologies          |
| Compuware                   | Sirco Associates Inc           |
| Decision Consultants Inc    | Software Services              |
| EDS                         | Strategic Staffing Solutions   |

May 16-11am-7pm Management Education Ctr, Troy  
May 17- 2 pm-8 pm Embassy Suites, Livonia

College degree/minimum 2 years' experience preferred. DP -all software languages/hardware platforms/operating systems; Engineering - all disciplines. For more information call 313.882.2277 or if you are unable to attend, fax your resume to 313.882.3626.

supported by: **COMPUTERWORLD DETROIT NEWSPAPERS**

## ANOTHER REASON WHY COMPUTERWORLD RECRUITMENT ADVERTISING WORKS ...

A late advertising close means you get quick response. Computerworld needs just 2 working days notice for your ad to appear in the next weekly issue!

In fact, when we receive your materials or faxed copy for your ad by 3 p.m. the Thursday before the Monday issue date, your ad will appear that Monday!\* (Space reservations closing date is the same time the previous day).

| Mon        | Tue | Wed | Thu                       | Fri |
|------------|-----|-----|---------------------------|-----|
|            |     |     | Space & Materials Close 1 | 2   |
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\* Holiday closings may vary. Please call for details.

To place your ad regionally or nationally, call John Corrigan, Vice President/Classified Advertising, at 800/343-6474 (in MA, 508/879-0700).

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Whether you want to run your ad in the Eastern, Midwestern, Western, National, or any combination of regional editions. Computerworld gives you the only regional recruitment advertising section available in the United States exclusively for computer professionals. And no other newspaper or magazine reaches so many qualified computer professionals regionally or nationally!

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IMMEDIATE and continuing positions available for IS Professionals with 3 years+ experience include:

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- AS400, Mepics DB, RPG
- AS400 Project Manager
- Sybase, client/server
- AS400, RPG, JD Edwards
- Internals manufacturing
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- DB2, COBOL, CICS, JCL, MVS
- Natural/Adabas, DB2, SQL, client/server
- Powerbuilder, DB2, client/server
- Powerbuilder, Oracle or Sybase, UNIX
- C, Ingress, PMS, VAX
- COBOL, CICS, DL/I, IMS, DOS/VSE
- Windows, Powerbuilder or C or Visual Basic (design experience)
- IDMS, ADSO, TSO, Easytrieve
- ABAP (SAP)

#### EAST TENNESSEE

- DB2, COBOL II, IMS, CICS
- DB2, CICS, Explorerator, Data Analyst
- COBOL, CICS, DB2, Systems Analyst
- DB2, DBA (client server experience a plus)

#### NORTH FLORIDA

- COBOL, CICS, MVS, Shaw
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**AMERICAN COMPUTER PROFESSIONALS**  
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800-833-9227  
FAX: 803-779-1955

Software Engineer, 40hrs/wk, 9-6, \$40,000/yr. Design & implement advanced telecom products as part of a design team of hardware & software engineers. Implement X.25 & HDLC protocols. Design & implement interrupt-driven device drivers for new hardware. Design & write multi-process software systems in C & C++ on UNIX. Design & write real-time software, including ASSEMBLER interfaces to hardware. Min reqs: MS in Computer Science, 2 yrs in carrying out these duties set forth in the job offered or 2 yrs in developing telecom products with hardware engineers, in designing & implementing data communication software, multi-process systems in C on UNIX, & interrupt driven device drivers, in implementing X.25 & HDLC protocols, in designing & writing real-time software, & in programming in C & ASSEMBLER. 3 credit hrs in telecommunication networks. Apply at the Texas Employment Commission, Dallas, Texas, or send resume to the Texas Employment Commission, TEC Building, Austin, Texas 78778, J.O.# TX7213813. Ad Paid by an Equal Opportunity Employer.

Systems Analyst for software consulting company. Duties include: engineering consultant with automaker for CAD/CAM applications; specifically on PDGS (Product Design Graphics System). Specification, design, and development of CAD software for adding manufacturing information including tolerance analysis applications. Duties require development of functional specification and test plans utilizing PRIME and UNIX platforms in addition to using the following languages: C and FORTRAN-77 on PRIME, DEC-5000, SUN SPARC, and maintenance of existing code. Requires a Bachelor of Science degree in Mechanical Engineering or Computer Science. Requires two years experience in the job offered or two years experience as a Software Engineer including experience in the following: - Automated Tolerance Analysis; - PRIME and UNIX workstations. Salary is \$37,810.00 per year. Hours are 8:00 am to 5:00 pm, forty per week. Send resume to 7510 Woodward, Room 415, Detroit, MI 48202. Ref. #18594. Employer paid ad.



## Computer Careers Midwest

**Systems Analyst for Software**  
Consultancy company. Duties include: engineering consultant with auto maker for CAD/CAM/CAE applications; specifically on NVH (Noise, Vibration, Harshness). Responsible for NVH mathematics, modeling, development of new NVH analysis methodology and pre and post processor design. Requires working on the design and analysis process of mechanical systems and engineering numerical analysis methods, such as FEM (finite element method) and finite difference method. Duties require working on a variety of platforms running UNIX and using the following software and languages: C, FORTRAN, Nastran, Patran, Mortran, Windows (MOTIF) and CAE software documentation. Requires a Masters of Science degree in Mechanical Engineering/Computer Science. Requires one year six months experience in the job offered or one year six months experience as a Software Engineer. Salary is \$45,000.00 per year. Hours are 8:00 am to 5:00 pm, forty per week. Send resume to 7510 Woodward, Room 415, Detroit, MI 48202. Ref. #20494. Employer paid ad.

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DBAs Sybase ..... \$65K  
Mgr UNIX/COBOL/MVS ..... \$70K  
DA ERD OOD C++ ESOL ..... \$65K  
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P/As AS400 RPG CL ..... \$42K  
P/As CPCS/Vector/IPS ..... \$45K  
P/As Unix C Informix ..... \$44K  
P/As B.S. M&D/DCS ..... \$43K  
AIX System Eng ..... \$50K

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Tampa, Florida 33622  
813/286-9800  
FAX: 813/286-0574

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P/As VAX/VMS ..... \$40-65K  
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Strong/Corneliusson Capital Management, Inc. (investment advisor to the Strong family of mutual funds) is the largest investment management firm in Wisconsin, with over \$10 billion in assets under management. We are serious about using modern technology to compete, and our technical environment is state-of-the-art. Corporate data resides in Sybase on Sun servers; our business associates have 486 PCs on their desktops. Development is done in C++/C, Uniface and SQR. Our in-house methodology is streamlined, flexible and highly productive. We have immediate openings for

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You must have 2 or more years of business experience as a Software Engineer in UNIX client/server environments, preferably using C++/C. BS in Computer Science or a closely related field also required. Experience with Sybase or another RDBMS, tools for building graphical user interfaces, and object-oriented design is desired. We strongly prefer candidates with knowledge of, and interest in, the financial markets.

We offer excellent benefits and compensation, a world-class (and smoke-free) working environment, and opportunities for professional growth. If you are interested in joining our team, please send resume (no calls please) to:

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P.O. Box 2936  
Milwaukee, Wisconsin 53201

Equal Employment Opportunity Employer

### SOFTWARE ENGINEERS

Our privately-held company in Brookfield, WI is the leader in computer-based automated warehouse and distribution systems. As part of our team, you'll work with state-of-the-art technology (RF, GUI, barcoding, client/server, etc.) to devise innovative solutions. We're seeking:

**SOFTWARE ENGINEERS:** Requires a BS/MS degree in a Computer Science-related field (or equiv.) plus 3 yrs. experience in Unix, INFORMIX, 4GL/SQL, relational databases and C/C++.

**LEAD ENGINEER:** Requires a Computer Science degree (or equiv.) and 5+ yrs. experience utilizing C/C++, INFORMIX, 4GL/SQL, UNIX, and relational databases. Excellent organizational and interpersonal skills and the ability to lead junior project team members are essential. Experience in warehouse management systems, RF devices, networking, and GUI is a plus. Some travel required.

**PRINCIPAL ENGINEER:** Requires 7+ yrs. experience in material handling software, a Computer Science degree (or equiv.) and experience in the development, maintenance, and enhancement of software products.

We offer a highly competitive salary, comprehensive benefits and 401(k) Plan. For consideration, send resume with salary history to:

CW-130294  
Computerworld, Box 9171  
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Sears Merchandise Group, a leader in the Retail Industry, is looking for qualified candidates for positions in our Information Systems department.

## Application Developers With Retail Experience

We have multiple positions available in the following areas:

### PROGRAMMERS/ANALYSTS

Candidates will have 2-7 years of experience in systems with skills in one or more of the following areas:

- IBM 3900 MVS/ESA environment using one or more of the following: COBOL, APS, C, DB2, CICS, BAL, Teradata, VSAM, and/or JCL
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- RS/6000 environment using PICK/BASIC, TCP/IP or AIX
- Experience with case tools, structured methodologies, and distributed processing a plus

### ARCHITECTS

Candidates must have:

- Demonstrated experience in providing technical leadership within Information Systems environments (including hardware, software and communications)
- Strong interpersonal, communication and project planning skills

### PROJECT MANAGERS

Candidates must be able to:

- Prepare and monitor project plans and release plans
- Establish work priorities for team members
- Successfully bridge the gap between the business and I/S organization

All candidates must have:

- Strong organizational and planning skills
- Good verbal and written communication skills
- Bachelor's degree
- Retail experience is preferred

We offer a competitive salary and benefits package together with all the personal and professional advantages of a career with Sears. Interested candidates should submit a resume and salary history to: Sears Merchandise Group, 3333 Beverly Road, Office B2-278B, Hoffman Estates, IL 60179.

**SEARS**

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## SOUTHEAST

Join Computer Consulting Group, one of the Southeast's most dynamic consulting firms, and watch your career soar. We are seeking talented and motivated programmer/analysts and have immediate staff openings through our offices in Richmond, VA; Raleigh and Charlotte, NC; Greenville and Columbia, SC. Our immediate and continuing needs are:

- CICS & JCL IMS/COBOL
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- Natural/Adabas
- Corporate PC Trainers
- CICS & JCL IMS/COBOL
- Support Specialist
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### Computer Consulting Group

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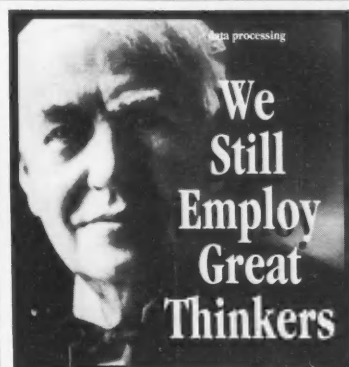
## Software Consultants

Arbor currently has openings for Project Managers, Programmers/Analysts and Programmers with experience in the following areas:

- Data Modeler/Architect/CASE REF, IEW, JAD
- RS/6000/UNIX System Administrator
- C++, X-WINDOWS, GUI, MOTIF
- SYBASE/POWERBUILDER
- PICK/PIPPER/INFORMIX
- VISUAL BASIC/MS-ACCESS
- LAN and WAN Network Support Specialist
- PC/DOs, C, CLIPPER

Qualified candidates should forward their resumes to:

Arbor Consulting Resources, Inc.  
7777 Bonhomme Avenue, Suite 1801, Clayton, MO 63105  
Phone: 314-725-7510 • Fax: 314-725-4843  
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## We Still Employ Great Thinkers

In 1882 Thomas Edison served as a director in one of Commonwealth Edison's founding companies. His ideas eventually brought light to Chicago's State Street, and the new power of electricity to millions.

In the mid-1960's men and women with Edison's ambition embarked on an equally impressive agenda: to supply the electrical needs of northern Illinois well into the 21st century. Their ideas created one of the largest and most visionary nuclear building programs in the world.

Today, we're the nation's largest nuclear utility with more opportunities for great thinkers in computer systems than any other utility.

We currently seek **DATA/DATABASE ADMINISTRATORS** with 2+ years experience performing database administration tasks in a relational database environment using DB2 and/or Sybase. Requires familiarity with data modeling and a BS in Computer Science. Prefer experience with SYBASE and CICS/ESA environments. IMS/TF, IEF, and/or IBM DB/DC data dictionary a plus.

Become a part of our team of great thinkers. If you are able to verify employment eligibility in the United States, have a "B" average and a BS/BA degree in Computer Science, Math, MIS or Engineering and an interest in working as a Computer Programmer, send your resume to: **COMMONWEALTH EDISON, Professional Recruitment**, P.O. Box 767, Chicago, IL 60690-0767. Equal Opportunity Employer M/F/D/V.



**Commonwealth Edison**  
A Generation Ahead

## SOFTWARE DEVELOPERS UNIX/'C' 400/RPG

Chicago based software company servicing worldwide manufacturing and distribution markets needs developers for its client/server product line. Strong technical skills in UNIX/C or 400/RPG required. Fax resume: 708-259-3480 Mail: CODE/DSS 3800 N. Wilke #485, Arlington Heights, IL 60004.

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DYNAMIC SEARCH SYSTEMS, INC.

PROGRAMMER / ANALYSTS  
& SYSTEMS PROGRAMMERS

### FOR CAROLINAS AND SOUTHEAST

Numerous opportunities exist for on-line and data base applications P/As as well as systems programmers and DBA's. Fee Paid. Please call or send resume to:

Keith Reichle, CPC  
Systems Search, Inc.  
4 Pine Point Rd.  
Lake Wylie, SC 29710  
803/831-2129  
(Local to Charlotte, NC)

## Computer Careers Midwest



**We've got a comfortable chair for you.**

### Oracle Developers

**IKEA**, the world's largest home furnishing retailer, offers an informal work environment described as Tieless without Titles! As a leader in defining innovative sales, distribution, and logistics concepts, we need to add several Oracle developers to our North American headquarters in suburban Philadelphia.

Qualified candidates will have 2-4 years experience with Oracle 6.0, Forms/Menu and SQL\*Plus in a VMS or UNIX environment. Experience with Pascal, C, SQL\*Net, and Oracle's CASE products is considered a plus. Applications include distribution, logistics, warehouse management, and sales administration.

IKEA offers a comprehensive benefits package including life, health and dental insurance, 401K plan, and tuition reimbursement. To join an industry leader, submit your resume with salary requirements in confidence to:



Plymouth Commons  
Plymouth Meeting, PA 19462  
Attention: Information Systems  
Fax: (215) 834-0872 • Compuserve: 71603, 252



**SENIOR SOFTWARE ENGINEER** - Provide specialized consulting services at client locations to design, develop, analyze & test cellular customer service & billing systems for domestic & international markets for state-of-the-art client/server-based computing environments. The position will require the usage of 4GL, C, Windows, SQL, FOR-IV, & relational databases (Informix, Oracle) in VAX/VMS, UNIX, & MSDOS environments. Bachelors degree in Computer Science or Computer Electronics required, plus 2 yrs. experience in job duties described or 5 yrs. related experience in software design & computer systems analysis (must include minimum of 2 yrs in customer service & billing systems in cellular telephone industry). Salary: \$55,000/Year for 40-hr. wk. Experiential references required. 3 Positions Available. Job Order # GA 5721866. Apply in Person or Submit Resume to Georgia Department of Labor, 2636-14 Martin Luther King Jr. Drive, Atlanta, GA 30311, or to the nearest Georgia Job Service Center.

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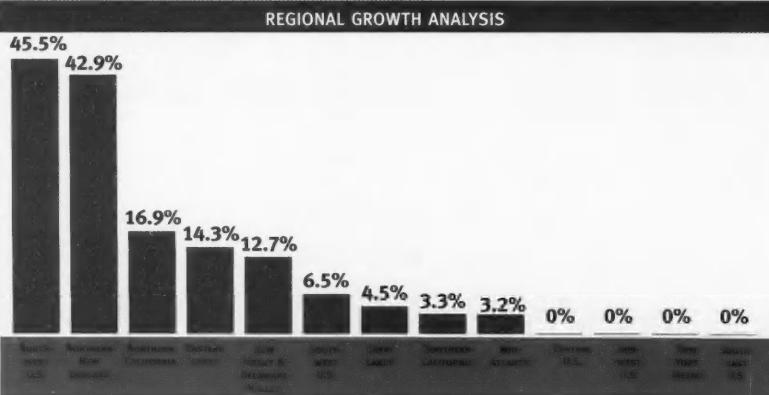
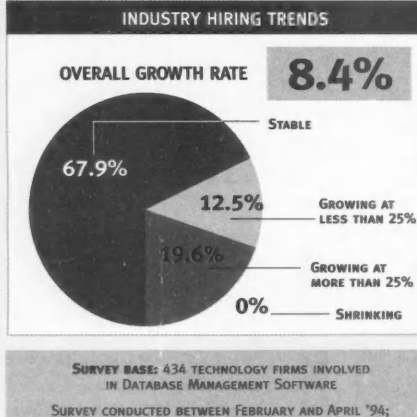
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# Marketplace

## Hot site snafus

By Alan R. Earls

Too many disaster recovery contracts are full of pratfalls and perils for the unwary. "The way this business operates is that a vendor buys equipment and then sells the use of it to as many customers as possible," says Jeff Marinstein, president of Contingency Planning Research, Inc. in Jericho, N.Y. "It is up to you to find out how many customers [they have] and whether they can really deliver in an emergency."

And it's important to be mindful of the

### Proof is in the pudding

Hot site providers promise the world but can overcommit their services. One way to determine their ability to deliver in an emergency is to ask whether they have been audited by an independent firm.

### Informality be banned

According to experts, fault also lies with the customer when recovery plans go awry. Although it's common advice, few companies take advantage of on-site testing.

### It's all gravy

Above all, negotiate a good price. After signing up a certain number of companies, vendors may be willing to come down in price.

specific wording of an agreement. Edmund Jones, a certified disaster recovery planner at Phoenix Consulting Services, Inc. in Warren, Mich., cites two firms he recently worked with. Both dis-

## There are a number of gotchas to be wary of when bargaining for disaster recovery

covered that the narrowly written contract they had relied on did not cover their new equipment, and "upgrading" under the terms of the contract was prohibitively expensive.

However, the disaster recovery field is highly competitive. Armed with the right information, customers can often negotiate to get the features they need at a price they can afford.

"As the industry matures, customers are becoming more savvy to problems," Marinstein explains. "Vendors have no sense of pricing ethics. Similar data processing configurations can vary in price by as much as 1,000%. Customers are beginning to understand this and use it for leverage."

### Hot, warm, cold, mobile

A wide variety of recovery services is available. At the top is the hot site, where all capabilities can be provided on short notice.

Warm sites, which are used less often, provide many but not all the needed features and require some setup. Cold sites, also called shell sites, are usually just computer-ready rooms with little else available.

A newer offering is mobile backup—a complete data center that is trucked to a site you select. However Jones notes, the customer must still provide electrical power, often impossible during an actual disaster.

"One of the biggest problems with disaster recovery contracts is that customers don't pay enough attention," Jones

says. "A large contract would be for \$10,000 per month. There are a lot of software packages that cost more than that, so IS doesn't tend to make it a priority."

Paying attention starts with under-

standing your needs. "Most customers look at how much [direct-access storage device] they have and at their processor and then get that same configuration from a vendor," says Patti Fitzgerald, an editor at St. Louis-based *Disaster Recovery Journal*. "In an actual disaster they might only want to use a fraction of that to sustain operations — the rest goes to waste."

Thinking through disaster scenarios is important in other ways. For example, you need to make sure you are well covered on telephone and data lines and have a handle on what these items will cost. Or you may need ancillary services such as warehousing and printing that might cost a lot to add on if they aren't negotiated up front, Fitzgerald notes.

If there is any possibility that your needs may change, either through growth, upgrades or switching architectures, make sure you can alter the contract without onerous penalties, Fitzgerald says.

### Hard bargains

John Copenhaver, an attorney at Bell-South Corp. in Atlanta who specializes in disaster recovery issues, notes that first and foremost, it is worthwhile to get legal advice. "It is important to understand the legal implication of the [contract's] language because you want to be sure you can hold a vendor liable in the event they fail to come through." To date, however, few if any information systems' disaster recovery contracts have resulted in court cases.

Jones also warns about reading the fine print. "Be sure you understand what the contract's duration is, whether it is self-renewing and the cost of any buyout provisions," he says.

The corollary point, Marinstein notes, is that everything is negotiable — often to your benefit. "Particularly since IBM came into the business with more relaxed terms for reducing commitments, other vendors have also grown more flexible," he says.

### Don't sign a disaster recovery contract until you ask the provider the following questions:

- How much does it cost to terminate early?
- How much do changes cost?
- How many customers do you service?
- How many companies rely upon the primary location?
- How often can we test and train on-site?
- Is the contract self-renewing?

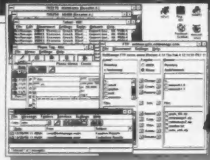
Although critical of vendors, Marinstein also faults many customers. "Statistics indicate that the typical duration for use of a hot site is seven days," he says. "Just to set up usually takes 24 to 72 hours, yet many subscribers don't even bother to take advantage of their annual testing time at the vendor's site." Jones, too, sees a lack of customer care. "In most cases there is no formal [request for proposal] from the customer. It is all very informal," leaving room for vendors to craft contracts that work to their benefit.

Earls is a free-lance writer in Franklin, Mass.

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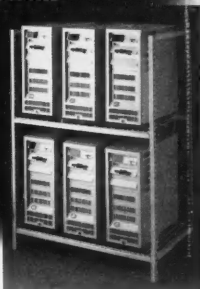
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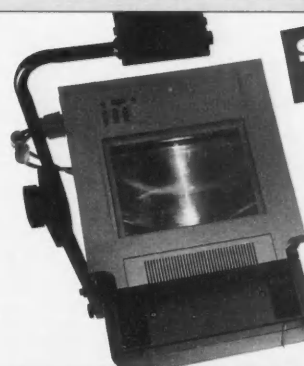
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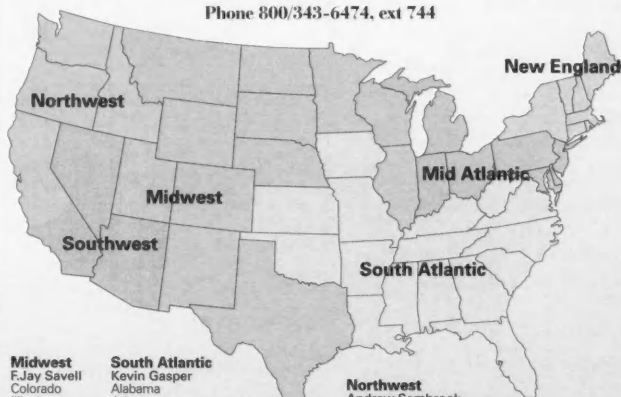




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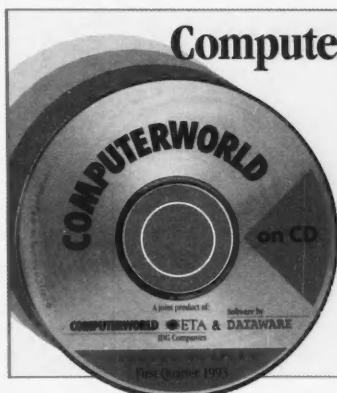
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# Friday Stock Ticker

## Gainers

## Losers

### Percent

PLATINUM SOFTWARE  
RADIOPARTS  
COSMETICS CORP.  
DELT COMPUTER CORP.  
CARTER CORP.  
COREL CORP.  
NETWORK COMPUTING DEVICES  
INFORMATION RESOURCES

39.5  
27.0  
17.4  
15.6  
13.0  
13.0  
12.5  
12.1

### Dollar

PROGRESS SOFTWARE CORP.  
DELT COMPUTER CORP.  
ZILLO INC.  
PAYCHEX  
COREL CORP.  
TANDY CORP.  
NEWBRIDGE NETWORKS CORP.  
NETMAGE INC.

7.13  
-5.75  
-5.00  
-4.75  
-4.00  
-3.38  
-3.38  
-3.25

SAPIENS INTL. CORP. N.Y. (L)  
MCAFFE ASSOCIATES  
CENTIGRAM COMMUNICATIONS  
GANDALF TECHNOLOGIES INC.  
CHEYENNE SOFTWARE INC.  
PROTEON INC.  
BMC SOFTWARE INC.  
Hewlett Packard Co.

-50.6  
-16.0  
-15.4  
-13.6  
-12.5  
-11.8  
-11.8  
-3.25

## Will the top of the line top out?

Analysts gave Linear Technology Corp. (LLTC) an unequivocal thumbs up, agreeing that the semiconductor company is by far the strongest in its group. But investors should consider how far the best of the best can go.

Linear currently operates with a whopping 43% profit margin while the average semiconductor company maintains a much lower 19%, according to Gerry Moore, an analyst at Cowen & Co. in Boston. But Moore conservatively rated Linear as a Buy and said its outstanding market lead may make it more vulnerable should the industry see a sudden correction.

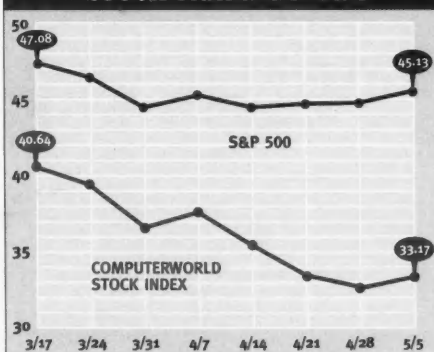
The question, Moore said, is not the company's current or future strength; rather, there is a chance the company's profit may eventually reach a plateau. So while investors' returns should be solid, they may not set off any fireworks.

"There's no doubt Linear is extremely attractive," Moore said. "Its sales are growing by 30% a year. But its profits are about as high as they can be. Where can they go from here?"

Nonetheless, John Marren, an analyst at Alex. Brown & Sons, Inc. in New York, said Linear is unquestionably a strong buy. "It has limited competition and a very diverse product line and customer base," Marren said. "That gives the company good stability in both a rising and declining economy." Marren's 12-month projection for Linear is \$60 per share. Moore agreed with that target, adding that Linear projects 27% to 30% growth in sales and earnings in the next two years.

—Erin Callaway

## STOCK TRADING INDEX



Each 52-Week Range May 6 52-Week Range

Off 1.92%

| Company                        | Price  | Change |
|--------------------------------|--------|--------|
| 3COM CORP.                     | 58.25  | 0.63   |
| AMERITECH CORP.                | 38.00  | -1.75  |
| AT&T                           | 51.75  | 0.63   |
| BAYAN SYSTEMS INC.             | 12.38  | 0.63   |
| BELL ATLANTIC CORP.            | 50.50  | -2.90  |
| BELLSOUTH CORP.                | 58.50  | -2.75  |
| BOLT, BERANEK & NEWMAN         | 12.38  | 0.63   |
| BROOKTRUST TECHNOLOGY          | 13.00  | -0.75  |
| CABLETRON SYSTEMS              | 100.25 | -2.25  |
| CENTIGRAM COMMUNICATIONS       | 25.50  | -4.00  |
| CHIPCOM CORP.                  | 46.25  | 0.00   |
| CISCO SYSTEMS INC.             | 30.63  | 0.00   |
| COMPRESSION LABS INC.          | 12.25  | 0.25   |
| COMPUTER NETWORK TECH.         | 8.06   | -0.19  |
| CROSSCOM                       | 10.00  | -0.38  |
| DATA SWITCH CORP.              | 2.00   | -0.13  |
| DEC COMMUNICATIONS             | 59.63  | -0.25  |
| GANDALF TECHNOLOGIES INC.      | 0.98   | -0.14  |
| GENERAL DATA COMM.             | 12.00  | -0.75  |
| GTE CORP.                      | 31.00  | -0.75  |
| ICI CORP.                      | 86.88  | -3.38  |
| MIT COMMUNICATIONS CORP.       | 27.75  | 0.13   |
| MICROCOM INC.                  | 5.25   | -0.38  |
| NETMAGE INC.                   | 6.25   | 0.50   |
| NETRAC CORP.                   | 36.00  | 2.00   |
| NETWORK COMPUTING DEVICES      | 12.75  | 0.75   |
| NETWORK EQUIPMENT TECH.        | 7.75   | -0.38  |
| NETWORK GENERAL                | 17.00  | -0.88  |
| NETWORK SYSTEMS CORP.          | 6.43   | 0.25   |
| NEWBRIDGE NETWORKS CORP.       | 51.25  | 2.50   |
| NORTHERN TELECOM LTD.          | 29.88  | 0.13   |
| NOVILL INC.                    | 18.50  | 0.00   |
| NYNEX CORP.                    | 36.88  | 0.50   |
| OCTEL COMMUNICATIONS CORP. (L) | 20.25  | -0.24  |
| OPTICAL DATA SYSTEMS INC.      | 16.13  | 0.13   |
| PERMUT DATA COMMUNICATIONS     | 9.50   | 0.25   |
| PICTURETEL CORP.               | 13.38  | 1.13   |
| PROTEON INC.                   | 5.63   | -0.75  |
| RACOTEC INC.                   | 8.00   | -1.00  |
| SCIENTIFIC ATLANTA INC.        | 33.50  | 0.25   |
| SOUTHWESTERN BELL CORP.        | 39.75  | -2.00  |
| SPRINT CORP.                   | 29.63  | 0.63   |
| STANDARD MICROSYSTEMS CORP.    | 17.50  | -0.25  |
| STRATACOM INC. (H)             | 22.63  | -0.25  |
| TELECOM SYSTEMS CORP.          | 18.50  | 0.00   |
| TELETRAC CORP.                 | 10.13  | -0.88  |
| US ROBOTICS                    | 32.06  | -0.19  |
| US WEST INC.                   | 39.63  | -1.63  |
| WELLS FARGO COMMUNICATIONS     | 75.00  | 1.75   |
| XIRCOM                         | 20.00  | -0.25  |
| XYPLEX INC.                    | 16.00  | -0.25  |

Off 1.30%

| Company                 | Price | Change |
|-------------------------|-------|--------|
| ADVANCED LOGIC RESEARCH | 5.25  | 0.13   |
| APPLE COMPUTER INC.     | 31.50 | 1.50   |
| AST RESEARCH INC.       | 18.25 | 0.50   |
| ASTROTECH CORP. (H)     | 10.13 | -0.25  |
| DELT COMPUTER CORP.     | 25.88 | 3.50   |
| GATEWAY 2000 INC. (L)   | 15.63 | 0.13   |
| HEWLETT PACKARD CO.     | 77.00 | 3.25   |
| SILICON GRAPHICS        | 24.25 | -0.75  |
| SUN MICROSYSTEMS INC.   | 22.00 | -0.25  |
| TANDY CORP.             | 35.63 | 2.50   |
| ZEOS INTERNATIONAL LTD. | 3.00  | -0.13  |

Off 1.15%

| Company                   | Price | Change |
|---------------------------|-------|--------|
| ADDS SYSTEMS INC.         | 25.88 | 0.63   |
| ALBUS CORP.               | 28.50 | -0.50  |
| AMERICAN SOFTWARE INC.    | 5.38  | 0.25   |
| ASK COMPUTER SYSTEMS      | 9.50  | 0.50   |
| AUTODESK INC.             | 52.88 | 1.69   |
| BACHMAN INFO. SYSTEMS (L) | 2.25  | -0.25  |
| BIGS SYSTEMS INC.         | 20.75 | 1.00   |
| BMC SOFTWARE INC.         | 53.50 | -7.13  |
| BOOKER & BARBAGE          | 27.38 | 0.38   |
| BORGARDT INT'L INC.       | 12.25 | 0.38   |
| BROCK CORP. SYSTEMS INC.  | 20.00 | 0.75   |
| CE SOFTWARE               | 3.13  | -0.13  |
| CHEYENNE SOFTWARE INC.    | 21.88 | -3.00  |
| COMPARTECH CORP.          | 44.25 | 0.25   |
| COMPUTER ASSOCIATES       | 32.13 | -0.38  |
| COMPUTERVISION CORP.      | 3.88  | -0.13  |
| COMPUTER TASK GROUP       | 6.00  | 1.25   |
| COMPUSEARCH INC.          | 11.00 | 0.00   |
| CORTEL CORP.              | 22.88 | 2.63   |
| EASTL CORP.               | 4.38  | 0.13   |
| FILENET CORP.             | 25.00 | -2.25  |
| 4TH DIMENSION             | 6.13  | 0.00   |
| FRAME TECHNOLOGY          | 5.25  | 0.25   |
| GROUP 1 SOFTWARE          | 7.50  | 0.00   |
| GUPTA                     | 14.38 | -0.88  |
| HODAN SYSTEMS INC.        | 8.25  | -1.13  |
| IMRS                      | 21.00 | -2.63  |
| INFORMATION RESOURCES     | 16.25 | 1.75   |
| INFORMIX CORP.            | 17.00 | 0.38   |
| INTERGRAPH CORP.          | 9.44  | -0.06  |
| INTERLEAF INC.            | 6.63  | -0.25  |
| INTERSOFT INC.            | 11.56 | 0.56   |
| INTUIT INC.               | 30.25 | -5.75  |

Each 52-Week Range May 6 52-Week Range

Off 0.88%

| Company                      | Price | Change |
|------------------------------|-------|--------|
| KNOWLEDGEWARE INC.           | 10.63 | 0.00   |
| LEGENT CORP.                 | 29.13 | -2.13  |
| LOTUS DEVELOPMENT            | 62.25 | -1.38  |
| MAGIC SOFTWARE ENTERPRISES   | 12.63 | -0.63  |
| MANUQUESTS GROUP INC.        | 6.75  | 0.50   |
| MATHSOFT INC.                | 8.25  | -0.91  |
| MCAFFE ASSOCIATES            | 8.75  | -1.50  |
| MENTOR GRAPHICS              | 11.63 | -0.38  |
| MICRO FOCUS (L)              | 32.50 | -2.50  |
| MICROGRAFX INC.              | 6.38  | -0.25  |
| MICROSOFT CORP.              | 91.13 | -1.63  |
| ORACLE CORP.                 | 29.75 | -0.13  |
| PARAMETRIC TECHNOLOGY        | 2.25  | 0.88   |
| PACIFIC PLACE SYSTEMS INC.   | 19.00 | 1.25   |
| PROLOGIST                    | 28.00 | -2.75  |
| PUDENIX TECHNOLOGIES         | 5.25  | 0.25   |
| POWERSOFT                    | 49.25 | -4.75  |
| PLATINUM SOFTWARE            | 6.63  | 1.88   |
| PLATINUM TECHNOLOGY          | 13.50 | 0.50   |
| PROGRESS SOFTWARE CORP.      | 49.75 | 5.25   |
| QUANTUM CORP.                | 2.81  | 0.19   |
| RAINBOW TECHNOLOGIES INC.    | 14.50 | -1.00  |
| RADIOPARTS                   | 5.88  | 1.25   |
| ROST SYSTEMS                 | 5.25  | 0.13   |
| SAPIENS INTL. CORP. N.Y. (L) | 4.88  | -5.00  |
| SAFARI INTERNATIONAL INC.    | 11.88 | 0.63   |
| SOFTWARE PUBLISHING CORP.    | 4.88  | -0.31  |
| SOFTWARE TOOLS INC.          | 14.13 | 0.38   |
| STATE OF THE ART             | 7.50  | 0.00   |
| STERLING SOFTWARE INC.       | 31.25 | 2.00   |
| STRUCT. DYNAMICS RESEARCH    | 10.50 | -0.56  |
| SYRACUSE (H)                 | 51.88 | 2.25   |
| SYNANTEC CORP.               | 15.25 | -0.38  |
| SWDPSYS                      | 37.50 | -2.00  |
| SYSTEM SOFTWARE ASSOC.       | 4.25  | -0.13  |
| TECHNIZON CORP.              | 4.25  | -0.13  |
| VIEWLOGIC SYSTEMS            | 22.25 | -2.25  |
| WALKER INTERACTIVE SYSTEMS   | 8.00  | -1.11  |
| WALTA DATA INC.              | 35.25 | -1.13  |

Off 0.88%

| Company                       | Price | Change |
|-------------------------------|-------|--------|
| AMERICAN POWER CONVERSION     | 22.00 | -0.50  |
| BANCTEC INC.                  | 22.50 | 0.50   |
| CAMTECH CORP.                 | 3.38  | -0.25  |
| COSINTRONICS CORP.            | 6.63  | -0.75  |
| CONNER PERIPHERALS            | 15.25 | -0.13  |
| CREATIVE TECHNOLOGIES INC.    | 24.00 | 1.50   |
| DATA RACE (L)                 | 5.00  | 0.13   |
| DATARAM CORP.                 | 4.69  | -0.31  |
| EMC CORP.                     | 18.13 | 0.75   |
| EMULEX CORP.                  | 3.13  | 0.13   |
| EVANS & SUTHERLAND            | 16.63 | 0.38   |
| EXARTE                        | 18.13 | -1.38  |
| INTELLIGENT INFO. SYSTEMS     | 2.25  | -0.13  |
| IONEGA CORP.                  | 2.25  | -0.13  |
| IPL SYSTEMS INC.              | 6.50  | 0.50   |
| KOMAS INC.                    | 26.63 | 0.13   |
| MAXTOR CORP.                  | 6.31  | 0.06   |
| MICROPLUS CORP.               | 6.63  | -0.38  |
| FINNACLE MICRO INC.           | 15.00 | -1.25  |
| PHINTRONIX INC.               | 9.00  | 0.75   |
| QMS INC.                      | 7.88  | -0.13  |
| QUANTUM CORP.                 | 17.00 | -0.88  |
| RADIX INC.                    | 6.75  | -0.13  |
| RECOGNITION INTERNATIONAL (L) | 9.88  | -0.13  |
| RESON INC.                    | 6.13  | -0.13  |
| SEAGATE TECHNOLOGY            | 24.38 | 1.00   |
| STORAGE TECHNOLOGY            | 27.88 | -2.00  |
| TESTRONIX INC.                | 28.88 | -1.38  |
| VERON CORP.                   | 99.50 | -0.75  |

Off 0.25%

| Company                  | Price | Change |
|--------------------------|-------|--------|
| AMERICAN MGMT. SYSTEMS   | 20.50 | 0.38   |
| ANACOMP INC.             | 4.13  | 0.25   |
| ANALYSTS INT'L           | 16.00 | 0.50   |
| AUTO DATA PROCESSING     | 50.38 | -1.13  |
| CAMBRIDGE TECH. PARTNERS | 16.38 | 1.38   |
| CERIDIAN CORP.           | 23.50 | -1.13  |
| COMPUSEARCH INC.         | 6.00  | 0.75   |
| COMPUTER TASK GROUP      | 10.75 | 0.75   |
| COMPUTER SCIENCES        | 40.25 | 2.25   |
| COMPUTER TASK GROUP      | 8.63  | 0.13   |
| COMPUSEARCH INC.         | 17.63 | -0.50  |
| EGEMON DISCOWARE SYSTEMS | 9.63  | -0.38  |
| GENERAL MOTORS (EDS)     | 34.13 | 0.38   |
| INACOM CORP. (L)         | 11.50 | -0.25  |
| INTELLIGENT ELECTRONICS  | 17.50 | 0.06   |
| MERISEL                  | 25.25 | 0.00   |
| MICROIMAGE INC.          | 27.75 | -2.13  |
| PAYCHEX                  | 29.00 | 0.75   |
| POLICY MANAGEMENT SYS.   | 29.00 | 0.75   |
| REYNOLDS AND REYNOLDS    | 21.75 | 0.38   |
| SEI CORP.                | 8.38  | -0.00  |
| SHARED MEDICAL SYSTEMS   | 24.25 | -1.19  |
| SHL SYSTEMHOUSE          | 6.88  | 0.25   |
| SOFTWARE SPECTRUM INC.   | 13.50 | -0.38  |
| SUNGARD DATA SYSTEMS     | 37.50 | 0.38   |

KEY: (H) = NEW ANNUAL HIGH REACHED IN PERIOD (L) = NEW ANNUAL LOW REACHED IN PERIOD

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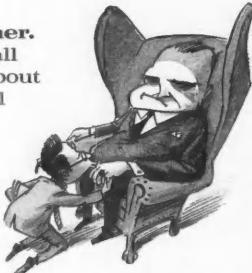
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# Wysiwyg

## What is your favorite MOVIE?

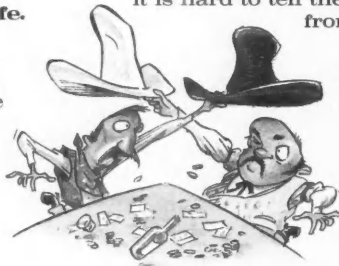
**"The Godfather.**  
It taught me all  
that I know about  
organizational  
behavior."

MARC JONES,  
PRESIDENT  
MADGE NETWORKS, INC.



**"Butch Cassidy and  
the Sundance Kid.**  
It combines action and  
romance, and as in real life,  
it is hard to tell the good guys  
from the bad."

DOUGLAS KAHN,  
CEO AND PRESIDENT  
EASEL CORP.



**"It's a Wonderful Life.**  
It is good to keep  
things in perspective.  
This movie reminds  
me that there is more  
to life than profit at  
any price."

BRUCE W. BROWN,  
CEO AND PRESIDENT  
FIBERMUX CORP.

— WYSIWYG COMPILED BY LISA DAVIDSON; ILLUSTRATIONS BY DANIEL VASCONCELLOS

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### Inside Lines

#### EMC unveils 'terabyte in a box'

Flush with the impressive market share gains rung up by its Symmetrix 5500 mainframe disk array, EMC Corp. plans this week to introduce a higher-capacity version with up to a terabyte of data storage. Analysts predicted it will compete with IBM's 3390 Model 9 "Fat DASD" product. Sources said it is expected to cost less than \$4 per megabyte with discounts, which would put it in the same range as IBM. List prices per megabyte should range from \$5 to \$7.

#### No buyers? Give it away!

At Digital's user group meeting this week in New Orleans, the financially troubled vendor will give away 2,000 or so copies of OpenVMS 6.1 for Alpha AXP and VAX, complete with migration tools to Alpha. Spokesmen said the copies are good for 60 days, during which time users can compare the functional equivalence of the Alpha and VAX versions of OpenVMS.

#### Picking Apples abroad

Those folks at Apple think they've figured out how to let cloners make the Macintosh without killing the Cupertino orchard, but some observers suggest the Macmeisters may be guaranteeing Intel's future dominance of the chip market. Apple chief exec Michael Spindler reportedly told analysts last week that the company will license the Power Macintosh in Asia and the original Macintosh in Europe within six months to a year. The licenses will supposedly be strictly administered and all but guarantee that Apple's clones will be about as unsuccessful as Sun's SPARC clone market.

#### Taligent developers to gather

In early June, Taligent will hold its first developer's conference, at which it is expected to roll out its long-awaited software developer's kit (SDK). First delivery of the kits will go to the company's three major investors — IBM, Apple and Hewlett-Packard. The kit is reportedly about 80% done.

#### Next stop Cairo? Not hardly.

Next's CEO Steve Jobs said he "wasn't surprised in the least" to hear that Microsoft has acknowledged that Cairo, its stab at object-oriented technology, will not ship until several months later than promised (see story page 4). Microsoft's delays prove that building object environments "is not easy stuff," Jobs said.

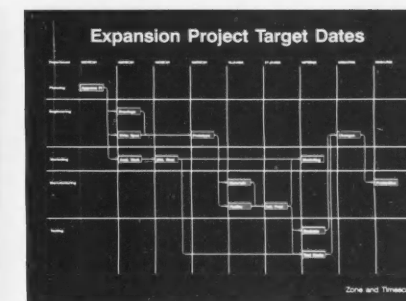
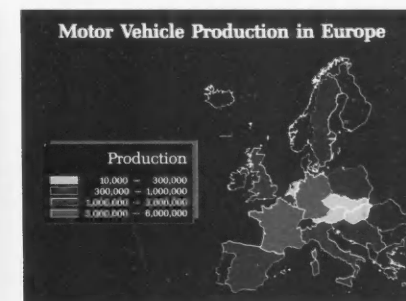
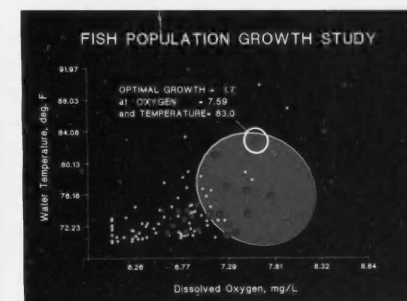
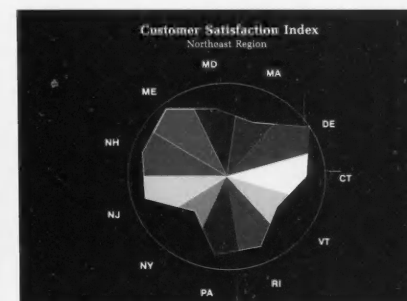
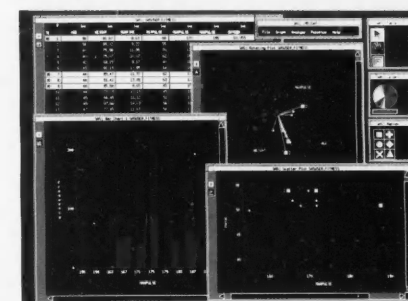
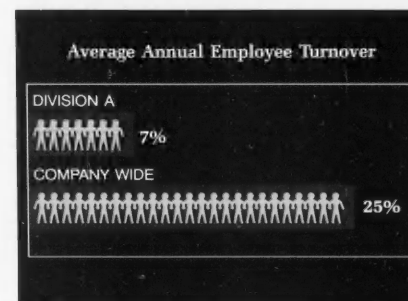
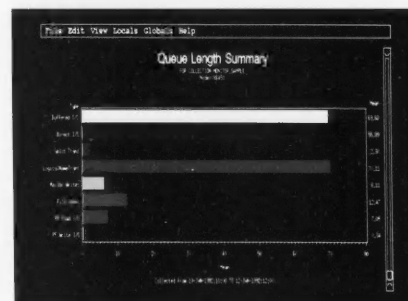
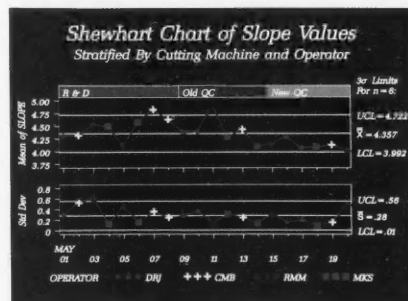
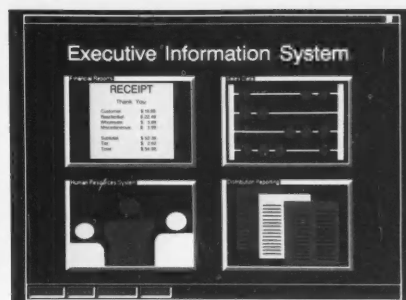
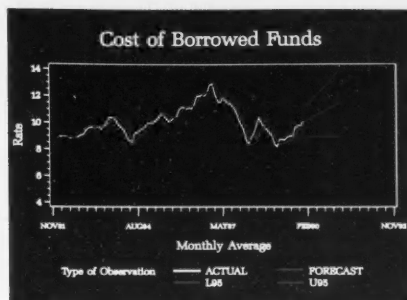
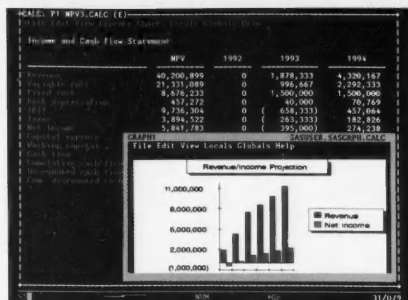
#### AS/400 users to bend IBM's ear

Executives at IBM's AS/400 division are warming to the idea of meeting with some large AS/400 shops that feel forgotten in the rush to dress up the midrange system in client/server clothes, according to Marc Cohn, senior vice president of IS at Enterprise Rent A Car. Cohn hopes a meeting can be set for late summer or early fall. IBM had been cautious about hosting the session until recently, he noted. "The last thing you want to do is gather a lot of dart-throwers together and let them feed off of each other."

#### Out to lunch

Don't expect Du Pont to become the next mega-outsourcing client anytime soon. The chemical giant last week said it is still very much in the evaluation stage and has asked some eight outsourcers to submit information by mid-June. Prospective vendors will have a tough sell because Du Pont's IS department received high marks in a recent evaluation by Real Decisions, a Darien, Conn.-based IS performance evaluation firm.

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